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In Memoriam

The *AASA Journal of Scholarship and Practice* would like to recognize two reviewers who passed away during the last year. Their expertise and service to the Journal was greatly appreciated and will be sorely missed.

Dr. Charles Achilles was a member of AASA for over 25 years and one of the original editorial board members of the *AASA Journal of Scholarship and Practice*, when it was first launched as *The AASA Professor*. During his academic career he was a professor the University of California at Berkley, University of Tennessee at Knoxville, Nova Southeastern University in Ft. Lauderdale, FL, the University of North Carolina at Greensboro, Eastern Michigan University in Ypsilanti, MI, and ended his career at Seton Hall University in South Orange, NJ. He was well-published with over 1000 papers and 17 books on various aspects of education. He was one of four principal investigators of the prestigious Tennessee STAR (Student-Teacher Achievement Ratio) Experiment, a small class-size study. Chuck was a member and officer of numerous educational societies, including NCPEA, MSERA, AERA, and AASA. In the foremost professional organization in his field, NCPEA, he served as its president in 1997 and was awarded the prestigious NCPEA Living Legend Award in 2001.

Dr. Judith Kerrins was a longtime member of the *AASA Journal of Scholarship and Practice* editorial review board. According to her university biography, her research in the field of education administration and leadership specialized in leadership, administration, expertise, and change. She received her PhD from the University of Colorado at Boulder in 1984. She was a frequent presenter at local, state, and national conferences and internationally at conferences held in Europe, Africa, and South America. Kerrins served as president of the California Association of Professors of Educational Administration and president of the CSU, Chico chapter of Phi Delta Kappa, from which she was also recognized with a Service Key Award. She was named Professor of the Year by the Association of California School Administrators and also traveled to South Africa as a Fulbright Summer Scholar.

Commentary

PISA Problems

Christopher Tienken, EdD
Assistant Professor
College of Education and Human Services
Department of Education Leadership, Management, and Policy
Seton Hall University
South Orange, NJ

Abstract

Pundits and bureaucrats use the results from international tests, particularly the PISA, to make claims about the quality of the public education system in the United States and make policy recommendations. In this article I argue, with evidence, that the scores and rankings from PISA are not important and that they cannot give policy makers or educators meaningful insights into student preparedness for the global economy.

Key Words

PISA, international testing, international comparisons

Introduction

The U.S. Secretary of Education, Arne Duncan, warned that the U.S. public education system was in a state of stagnation following the December 3, 2013, release of the 2012 Programme for International Student Assessment (PISA) results. Duncan (2013) proclaimed:

> The PISA is an important, comparative snapshot of U.S. performance because the assessment is taken by 15-year-olds in high schools around the globe. The big picture of U.S. performance on the 2012 PISA is straightforward and stark: It is a picture of educational stagnation. That brutal truth, that urgent reality, must serve as a wake-up call against educational complacency and low expectations.

How important are PISA results? I dispensed with the fraudulent claims by bureaucrats and pundits of educational stagnation in previous articles and books (Tienken, 2011; 2013a; 2013b; Tienken & Orlich, 2013).

Hence, I do not allocate many words for the topic here. In this article I argue that the scores and rankings from PISA are not important and that they cannot give policy makers or educators meaningful insights into student preparedness for the global economy.

Importance of PISA

Why would the results from one test, even a so-called international test of academic achievement, be important to the largest economy on the planet and third most populous nation? According to bureaucrats like Arne Duncan (2013) and some education pundits (Hanuschek & Woessman, 2008), the rankings from PISA equate to or even predict national economic fortunes. It seems to some, that the economic fate of nations hangs on PISA rankings. As Duncan (2013) exclaimed:

> In a knowledge-based, global economy, where education is more important than ever before, both to individual success and collective prosperity, our students are basically losing ground. We're running in place, as other high-performing countries start to lap us.

Duncan insinuates that the rankings from the PISA test provide important information about the quality of a country's education system related to preparedness for the knowledge-based, global economy.

In essence, according to the bureaucrats and pundits that use PISA results to make or suggest education policies, the PISA test rankings and scores (1) are a proxy for the overall education quality of a country, (2) quantify how prepared 15-year-olds are to compete in the global economy, and (3) predict future economic prosperity at the country level. But what does PISA say about PISA in terms of what the rankings and scores can and cannot tell about a nation's education system or future economic success?

What PISA Says Regarding Its Ability to Judge Quality

I wrote previously about some comments by PISA researchers (see Tienken, 2013c) regarding the appropriate use of the results as a proxy for education quality, and I use and expand upon that work in this article.

The Organisation for Economic Co-operation and Development (OECD, 2013, p. 265), the private entity that develops and vends the PISA, explains that policy makers should not use results either to indict or commend education systems. Furthermore, they should

not use the results to make important policy decisions. In fact, the OECD authors explain that PISA results are due to a combination of variables, including but not limited to schooling, life experiences/home environment, poverty, access to early childhood programs, and health.

> If a country's scale scores in reading, scientific or mathematical literacy are significantly higher than those in another country, it cannot automatically be inferred that the schools or particular parts of the education system in the first country are more effective than those in the second. However, one can legitimately conclude that the cumulative impact of learning experiences in the first country, starting in early childhood and up to the age of 15, and embracing experiences both in school, home and beyond, have resulted in higher outcomes in the literacy domains that PISA measures (p. 265).

Additionally, the OECD authors (2013) reported that parents' education level accounted for 23% of the 2012 mathematics score (p. 34).

Poverty

Although bureaucrats and pundits like to dismiss poverty as just another excuse by educators for poor performance, the information in the PISA technical manuals suggests otherwise. Poverty explains up to 46% of the PISA mathematics score in OECD countries (OECD, 2013, pp. 35-36), the United States being one of those countries.

The strong relationship between poverty and test results does not help the United States shine on the PISA. Remember that the United States has one of the highest childhood poverty rates of the major industrialized countries (OECD, 2009, p. 26). Approximately 22% of our public school children lived in poverty in 2012 compared to 15.6% in 2000 (Snyder, 2011, Table 27). In 2010, almost 48% of public school children qualified for either free or reduced lunch (Snyder, 2011, Table 45).

The United States ranks 26th out of 29 industrial countries in overall well-being of children, just ahead of Lithuania, Latvia, and Romania, but behind countries like Estonia, Hungary, and Slovakia (UNICEF, 2013, p. 2).

We can gain a glimpse of what the U.S. mathematics scale score and rank might be if we had only 15% child poverty compared to the 23% nationally. Massachusetts (MA) bureaucrats spent taxpayer money administering PISA to a representative population of their students.

Just as Tirozzi (as cited in Riddle, 2010) demonstrated with the results from the PISA 2009 tests, the U.S. rankings and scores change when the data are disaggregated by poverty rates. Students in schools with less than 10% of the students in poverty ranked and scored at the top of the world.

As I did with the TIMSS scores in 2012, I used the 2012 PISA math score and ranking from Massachusetts to model what the scores of students from a less poor America might look like on the PISA tables. Although 15% poverty is higher than almost all the countries that outranked the United States, it does provide a concrete example of the influence of poverty on PISA results and provides insight as to how the U.S. students might score if fewer of them lived in poverty.

Students in Massachusetts scored 520 on the mathematics portion. That score moves the United States from 29th to 12th, one point behind Estonia. If one disregards the non-representational cities that take PISA (Hong Kong, Macao, Shanghai) because their testing populations do not represent the country of

China, the United States moves into 9th place, hardly a crisis situation. The other countries that outrank the United States, including Switzerland, Lichtenstein, Netherlands, Japan, Korea, and Singapore, all have lower levels of child poverty than 15%.

Mathematical PISA Connection to Poverty

Poverty not only explains a large percentage of the PISA results, it also relates to important student attributes that further influence achievement.

Poverty relates to mathematical self-efficacy on the PISA, and self-efficacy relates strongly to mathematics achievement with a correlation of .5 (OECD, 2013b, p. 83) On average, 28% of the variance in PISA mathematics results can be explained by self-efficacy. In the United States the difference between students with high self-efficacy in math and those with low self-efficacy is approximately 50 scale score points (OECD, 2013b, p. 86). Poverty also relates to math anxiety.

Poorer students have more anxiety about math. Like self-efficacy, anxiety relates to achievement and accounted for an average of 14% of the variance in math scores (OECD, 2013b, p. 87).

Selection Bias

Some might question why I do not include the Chinese cities that are part of PISA in my analyses. I remove Hong Kong and Macao from international testing samples because their testing samples do not represent the country of China. They are special administrative regions of the People's Republic of China, and their schools do not follow all of the standardization requirements of the Chinese system (Levin, 2012).

I remove Shanghai because it is a city of almost 23 million people and home to almost 140,000 millionaires, making it the city with the third highest concentration of wealth in China. The population is highly educated and international. Approximately 83.8% of the high school seniors in Shanghai continued on to attend college in 2008 according to the Shanghai.gov (2013) official website.

Compare that to less than 25% of all high school graduates nationally in China (Loveless, 2013). The wealth and family demographics of Shanghai simply do not approximate those of the country of China, where 29% of the population, more than 392 million people, live on $2 a day or less (World Bank, 2012). That is more people than the entire population of the United States.

High school is not free in China. Only the students whose parents can afford to pay are in school at age 15. That limits the testing pool severely, even in Shanghai. Also, not all children who live in Shanghai are allowed to attend high school there, especially if those children are poor.

Some of the poorer children are required to attend high school in their ancestral provinces and not permitted in the Shanghai schools (Loveless, 2013). Do not expect to see many students with special needs in Shanghai or Chinese high schools in general. Many are not in school by age 15 (Ringmar, 2013).

Education prospects are even worse in the rural areas, and the statistics provide more evidence as to why the results from Shanghai should not be considered in analyses. According to the Rural Education Action Program (REAP, 2013a), only approximately 40% of rural children attend high school in China (REAP, 2013b) and between only 35-45% of students graduate from high school in China, not to mention that 25% of middle school students drop out before entering grade nine (REAP, 2013a). When "China" starts

taking the PISA, then I will include "China" in the testing samples for calculating ranks.

Right now, we basically have the general-education Beverly Hills version of China, masquerading as the nation of China, taking the PISA test.

Top of the Pack Teachers

Pundits and bureaucrats often make their rebuttals that it is teacher quality, not poverty or selection bias, nor a multitude of other issues with PISA, for the reason the United States ranks and scores so dreadfully low on PISA math. Well, the PISA authors have some data for that.

The PISA assessments include various surveys of students, teachers, and school principals. One such survey reports on teachers' use of cognitive activation strategies when teaching math. Only four countries, Bulgaria, Jordan, Qatar, and the United Arab Emirates (UAE), score higher on the use of those effective teaching strategies (OECD, 2013b, p. 117).

Another survey tracks the use of other effective teaching strategies. The United States ranks above the OECD average and near the very top of the following indicators: (a) The teacher sets clear goals for our learning; (b)

The teacher asks me or my classmates to present our thinking or reasoning at some length; (c) The teacher asks questions to check whether we have understood what was taught; (d) At the beginning of a lesson, the teacher presents a short summary of the previous lesson; and (e) The teacher tells us what we have to learn.

Only teachers in the countries of Chile, Mexico, Turkey, Albania, Bulgaria, Columbia, Indonesia, Jordan, Kazakhstan, Qatar, Russia, Shanghai, Thailand, and UAE rank higher on some, but not all of those, indicators than teachers in the United States (OECD, 2013b, p. 118).

For bureaucrats and pundits to claim that the U.S. ranking and score on the mathematics portion of the PISA is due to poor quality teaching, in the face of the evidence presented by PISA to the contrary, is feckless.

Proxy for Quality?

Are the PISA results in mathematics an appropriate proxy for the quality of an education system? I do not think so. Many factors influence PISA scores and rankings.

Based on the information presented by the OECD/PISA, poverty influences mathematics achievement directly, and indirectly through self-efficacy and anxiety.

The United States has one of the highest percentages of child poverty and one of the lowest levels of overall child well-being in the industrialized world. The technical details of the PISA results suggest (1) that it is the social fabric of a country that exerts a large amount of influence over the education system and achievement, and (2) achievement in the United States will improve greatly if poverty rates for children decrease.

The data suggest that factors outside the control of school personnel affect PISA scores in important ways. The results appear to provide a look into the overall society of a country on a very macro level rather than an accurate description of its education system.

Furthermore, the OECD researchers warn readers to remember that formal schooling does not end in most countries when a child turns 15 or 16, the ages of the PISA student testing pool. In most industrialized countries, the majority of students continue

their formal public school education for another two or three years; and they are exposed to more content in mathematics, science, and reading during those remaining years.

The OECD researchers explain that the results from a test of 15-year-old children could not account for all their academic abilities. According to the authors of the PISA 2009 technical manual (OECD, 2009 p. 261), student age and curriculum alignment contribute to some of the differences in the scores and rankings among countries.

> This is not only because different students were assessed but also because the content of the PISA assessment was not expressly designed to match what students had learned in the preceding school year but more broadly to assess the cumulative outcome of learning in school up to age 15. For example, if the curriculum of the grades in which 15-year-olds are enrolled mainly includes material other than that assessed by PISA (which, in turn, may have been included in earlier school years) then the observed performance difference will underestimate student progress.

The authors of the PISA technical manual state their cautions about curriculum alignment and the influence on results (2009, p. 48):

> PISA measures knowledge and skills for life and so it does not have a strong curricular focus. This limits the extent to which the study is able to explore relationships between differences in achievement and differences in the implemented curricula.

But what "skills for life" does PISA measure? A look at the released items suggests that some of the content measured is just rehashed versions of subject matter that has been around for the last 120 years: Hardly 21st century skills (Dancis, 2014; Sjoberg, 2012; Stewart, 2013). The PISA ranking or scale score does not provide insights into authentic resilience, persistence, collaboration, cooperation, cultural awareness, strategizing, empathy, compassion, or divergent thinking.

So, if the vendors of PISA repeatedly warn that (a) PISA is not aligned to school curricula, (b) the scores and ranks are influenced strongly by poverty and selection bias, (c) the skills are left over from the 19th and early 20th centuries, and (d) one test of a 15- year-old child cannot possibly represent the future success of that child or of a country, then what does PISA really tell us about the quality of a school system? Not much.

Prepared for Global Competitiveness?

What is global competitiveness? What jobs are U.S. children competing for and where are those jobs? How well does a PISA rank or score explain how a nation's students are prepared to "compete in the global economy" of the 21st century?

The OECD authors attempt to define global competitiveness (2013b).

> In this globalised world, people compete for jobs not just locally but internationally. With the integration of labour markets, workers in wealthier countries are competing directly with people with much the same skills in lower-wage countries. The competition among countries now revolves around the quality of their human capital and their ability to create the institutional structures and opportunities to effectively use the skills and talents of their populations. (p. 26)

The authors seem to speak with forked tongue on the issue. The first sentence suggests that the global economy includes competition for jobs from international actors. For example, a bureaucrat in the United States might claim that the "Chinese" will take our jobs. Yet the third sentence suggests that global competition hinges more on country-level industrial policies and countries should develop structures and opportunities for the skills of the people in their national populations. Finally, the second sentence indicates that the global economic competition is more about wages and costs.

But then, the OECD authors disregard their wages and costs argument and return to education as the sole solution to competitiveness:

> The result of technological progress has been a reduction in the demand for people who are only capable of doing routine work, and an increase in the demand for people who are capable of doing knowledge-based work or manual work that cannot be automated. This leads to a greater polarisation of labour market opportunities, both within and across countries, with a greater proportion of people who will need to be educated as professionals. (p. 26)

Within the span of two paragraphs, the authors move from competitiveness that is global in nature with students across countries competing for a seemingly limited number of jobs, based on wage pressures, to competition within countries in which markets should be created in part with help from government policy, and finally to a dichotomous market situation of knowledge-based work and manual labor. Perhaps it is a combination of those situations that makes up a more informed understanding of globalization.

International Competitors

The frequently peddled fear that students from China, India, or another country are going to come to the United States and take jobs away from U.S. students on a large scale does not hold empirical water. A foreign national must be issued a visa to claim employment in the United States, especially for high tech jobs and white collar employment.

There are limited numbers of visas issued because the quota is controlled by legislation enacted by the U.S. Congress, not based on a PISA rank. The knowledge-based jobs mentioned by PISA most commonly require H-1B or O visas.

In 2001, the annual quota for new H-1B visas was set by Congress at 115,000 (Ruiz et al., 2012). The total number of H-1B visas approved that year was 161,643. By 2011, the number dropped to approximately 130,000 with 11 out of the top 18 companies requesting H-1B visas being foreign owned doing business in the United States.

Those foreign-owned multinational corporations were importing labor from their home countries (Ruiz, et al., 2012; Thibodeau, 2009). Multinational corporations are not the only large-scale importers of foreign labor. The New York City public schools received 642 approvals in 2006 for visas, almost twice the number received by Google (McGee, 2007).

The takeaway is that the number of H-1B visas granted to highly skilled foreign workers is miniscule compared to the overall size of the labor force.

The fear that highly skilled foreign-born workers will "take" jobs from U.S. workers is overstated. The largest employment sectors for highly skilled workers include the U.S.

government and the defense and aerospace industries.

The government and high tech industries have strict rules severely limiting the employment of foreign-born workers in sensitive high-skill positions.

Couple that with the fact that the Congress could end completely the practice of allowing approximately 300,000 foreign born workers currently in the market from accessing the high skill U.S. job market, and the argument that there is large-scale competition between students across the globe does not match the evidence.

International Job Market

If global competition for high skill jobs from international actors in the United States does not exist on a large scale, then bureaucrats are not justified in attaching fear of international global competition for jobs to PISA rankings and scores.

But what about competition for jobs abroad? That competition is largely driven by employment in multinational corporations and entrepreneurial activities.

Large multinational corporations employ over 23 million Americans and account for over 19% of total employment, with 68% of the multinational workforce of U.S. parent companies coming from the United States (U.S. Department of Commerce, 2012).

An additional 5 million Americans were employed by majority-owned U.S. affiliates of foreign multinational corporations doing business in the United States (U.S. Department of Commerce, 2012). The majority of U.S. multinational corporate employees are American.

PISA Is Unprepared

Unfortunately for those who knowingly, or unknowingly, peddle PISA results to drive education policy, there are no relationships among PISA rankings or scores and being prepared for employment in multinational corporations or entrepreneurial activities.

Consider that approximately 10% of Chinese engineers and Information Technology (IT) workers are prepared to work in multinational corporations (Kiwana et al., 2012). Similarly, only 25% of Indian engineers and IT workers are employable in those types of corporations (Gereffi et al., 2006; Kiwana et al., 2012). Compare that to approximately 81% of U.S. engineers and IT professionals (Kiwana et al., 2012) who are qualified for employment in multinational corporations.

The results from the *2012 Global Chief Executive Officer Study* conducted by the IBM Corporation made several recommendations for the skills necessary in the global economy.

The recommendations run counter to the skills assessed on the PISA examination and call into question the use of PISA results as an indicator of being prepared for the global economy.

According to 1,700 CEO‘s representing 64 countries and 18 major industries, leaders and employees in the global economy must be able to:

(a) innovate
(b) collaborate and cooperate globally amongst themselves and with their customer bases;
(c) be creative;
(d) seek opportunity
(e) use complexity to a strategic advantage; and
(f) be communicative (pp. 21-24).

PISA tests 19th and 20th century skills, decontextualized, and based on imitation, regurgitation, and application of pre-existing and predetermined ideas and facts (Dancis, 2014, Sjoberg, 2012).

Furthermore, the most prevalent language used in multinational corporations is English. PISA does not test English language skills of non-English speaking students.

Entrepreneurial Drive

The United States was second only to Indonesia in the G20 group of countries in terms of the percentage of its population aged 25 years and older categorized as nascent entrepreneurs since 2006: 8.9% versus 9.6%. China had less than 6% of its population categorized as entrepreneurs (Global Entrepreneurship Monitor, 2013).

As I published previously (Tienken, 2013a), the authors of the Global Entrepreneurship and Development Index (Acs & Szerb, 2010), ranked the United States third on the overall Global Entrepreneurship Index, behind Denmark and Canada but ahead of countries like Japan, China, Singapore, and Finland. The United States ranked sixth on the index of Entrepreneurial Attitudes, ahead of Finland, Norway, Germany, Japan, and Singapore. China ranked in the lower third of the world. The United States ranked first on the Entrepreneurial Aspirations Index and sixth on turning those aspirations into reality, once again ahead of PISA powerhouses like Japan, Germany, Singapore, and Finland. China was near the bottom of the world rankings for aspirations and transforming aspirations into entrepreneurial actions.

A statistically significant relationship does not exist between PISA rankings and the percentage of a population that is entrepreneurial.

PISA rankings and scores do not equate to or relate to student readiness to compete in the global economy, neither at home nor on the international scene (Zhao, 2012). If they did, then students from Latvia, Estonia, Hungary, Slovenia, Vietnam, and Poland should be outcompeting students from the United States in the global marketplace based on their superior education. There is no evidence that is occurring.

The Real Competition

The real competition in the global economy is for wages and the transfer of high technology from multinational corporations that have it to countries that lack it.

The United States has one of the most highly educated and most productive workforces in the world (OECD, 2012) and one of the most highly paid. Because PISA measures skills more associated with those required for routine manufacturing or industrial jobs, the discussion of rankings and scores does not influence the real competition. Keep in mind the ranks and scores relate to the performance of 15-year-olds.

Learning and the development of economically competitive adults do not end at age 15. PISA ranks and scores do not relate to the percentage of adults with undergraduate degrees in a country or the percentage of PhD's.

Waging Competition

Wages play a role in competitiveness (Bureau of Labor Statistics, 2012). In many cases, for-profit multinational corporations, like GE or Boeing, are beholden to shareholders, not the greater good of the residents of the United States. Their goal is to maximize profits.

Therefore, it is more likely that they look to hire employees at the lowest wages the

market will allow and set up factories in countries with the lowest overall costs of doing business (Prestowitz, 2012). The ideology of shopping for the lowest bidder was exemplified by the comments of former GE CEO Jack Welch during a 1998 interview with Lou Dobbs on CNN's Money Week. Welch said, "Ideally, you'd have every plant you own on a barge to move with currencies and changes in the economy."

The concept of shopping for employees nullifies the claim that high PISA scores translate to higher levels of competitiveness. Competitiveness is a combination of labor stock, wage pressures, trade policy in terms of tariffs and protectionism, and fluctuations in currency rates, to name a few factors (Prestowitz, 2013).

In the G8 and G14 groups of countries, the education levels are already the highest in the world. The labor stocks exist. Businesses have gone, and continue to go, to less developed countries that have small pockets of well-educated people and set up shop because those people will work for $2—$25 dollars a day instead of $250. How is a PISA rank going to fix that problem?

In terms of the highest of the "high-tech" jobs, the United States is not losing competitiveness because of education policy. It is losing competitiveness because of industrial policy.

Companies like GE and Boeing recently signed multi-year agreements with the Chinese government that will allow them to sell Boeings and GE avionics equipment in China. However, the catch is that those companies must transfer the technology to the Chinese (Prestowitz, 2012).

Not only are large U.S. based corporations giving away the technology, they are also giving away some of the high technology jobs involved in designing, making, and installing the Boeings and avionics equipment. Project 20-30 years forward and will this mean that the United States is importing Boeings from China made mostly with American trained Chinese labor?

The United States already imports the tail stabilizers for some 737 aircraft from a Chinese manufacturer (Prestowitz, 2012).

Why? Because the drive to maximize profits through low wages and overall costs is not due to a shortage of qualified workers in the United States.

But also because large, U.S. based multinational corporations want access to the Chinese market and they are making the taxpayers pay for that access by importing products from the Chinese that are already made or can be made easily in the United States.

The United States bureaucrats in the government could make the imported Chinese stabilizers less cost effective by attaching tariffs. They could restrict high technology from being transferred. But they do not. Ranks and scores on PISA will not fix those problems.

Do not be fooled. There is a strong, statistically significant relationship between our growing trade with China since 2001 and the loss of our high quality manufacturing jobs (Pierce & Schott, 2012; Traywick, 2013).

Technology transfers have also increased steadily since 2001. Is it surprising that wages and overall labor costs are reasons multinational corporations choose to sell out the American public and set up shops in places like Pakistan, Cambodia, India, China, Bangladesh, and Haiti?

Crystal Ball of Economics

Some, including the vendors of the PISA, have claimed that PISA points translate to increases in gross domestic product (Duncan, 2013, Hanushek & Woessman, 2008; OECD, 2010). Of course one test score or rank cannot possibly predict economic growth or sustainability, but the claims persist. U.S. students have never scored at the top of the ranks on PISA or any other international test given since 1964.

Students from countries like Estonia, Slovenia, Slovak Republic, Poland, and Latvia outrank U.S. students on every PISA. What is their per-capita GDP? It is not even close to that of the United States (CIA World Fact Book, 2013). How many Nobel Prizes have they won? How many utility patents do they produce each year? Are they going to "out-compete" the United States? I don't think so.

The United States produces almost as many utility/innovation patents per year as the rest of the world combined (USPTO, 2012). U.S. scientists produce the largest number of scientific papers per year, and those papers are cited over 40 million times (Thompson Reuters, 2011).

The United States has outpaced the world in Nobel Prizes in the sciences and medicine since 2000 by a factor of almost 4 (Nobelprize.org, 2013). Ranks on PISA or any other international test do not relate well to economic strength in the G20 countries (Tienken, 2008) or overall global competitiveness.

The supposed cause and effect link between international test rankings and economics for the largest economies on the planet is a fallacy.

Author Biography

Christopher Tienken, EdD is a professor at Seton Hall University in the Department of Education Leadership, Management, and Policy. His research focuses on curriculum and assessment policy. His latest book, with co-author Don Orlich, is *The School Reform Landscape, Fraud, Myth, and Lies*. For more articles and information visit him at www.christienken.com. E-mail: christopher.tienken@shu.edu

References

Acs, Z. J., & Szerb, L. (2010, June). *The global entrepreneurship and development index (GEDI)*. Paper presented at the DRUID summer conference, London. Retrieved from http://www2.druid. dk/conferences/viewpaper.php?id=502261&cf=43

Bureau of Labor Statistics. (2012). *International comparison of manufacturing productivity and unit labor cost trends, 2011*. Department of Labor. Retrieved from http://www.bls.gov/news.release/pdf/prod4.pdf

Central Intelligence Agency [CIA] (2013). *World fact book: Country comparison. GDP per capita* . Author. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html

Dancis, J. (2014). What does the international PISA math test really tell us? *AASA Journal of Scholarship and Practice, (10),* 4. Retrieved from http://www.aasa.org/jsp.aspx

Duncan, A. (2013, December 3). *The threat of educational stagnation and complacency*. Retrieved from http://www.ed.gov/news/speeches/threat-educational-stagnation-and-complacency

Gereffi, G., Wadhwa, V., & Rissing, B. (2006). *Framing the engineering outsourcing debate: Comparing the quantity and quality of engineering graduates in the United States, India and China*. Available at SSRN: http://ssrn.com/abstract=1015831 or http://dx.doi.org/10.2139/ssrn.1015831

Global Entrepreneurship Monitor. (2013). *Key indicators*. Author. Retrieved from http://www.gemconsortium.org/key-indicators

Hanushek, E. A., & Woessmann, L. (2008). The role of cognitive skills in economic development. *Journal of Economic Literature*, *46(*3), 607-668.

IBM Corp. (2012). *Leading through connections. Insights from the global chief executive officer study*. CEO C-Suite Studies.

Kiwana, L., Kumar, A., & Randerson, N. (2012).The skills threat from China and India – Fact or fiction. Engineering U.K. Retrieved from http://www.engineeringuk.com/_resources/documents/Engineering_Graduates_in_China_and_India_-_EngineeringUK_-_March_2012.pdf

Loveless, T. (2013). PISA's China problem. Brookings. Retrieved from http://www.brookings.edu/blogs/brown-center-chalkboard/posts/2013/10/09-pisa-china-problem-loveless

Mcgee, M. K. (2007, May 17). Who gets H-1B visas. *Information Week*. Retrieved from http://www.informationweek.com/who-gets-h-1b-visas-check-out-this-list/d/d-id/1055227?page_number=2

Nobelprize.org. (2013). Nobel Prize API. Retrieved from http://console.apihq.com/nobel-prize-api

Organisation of Economic Co-operation and Development [OECD]. (2009). *Doing better for children*. Author. Retrieved from http://www.oecd.org/els/family/43570328.pdf

Organisation of Economic Co-operation and Development [OECD]. (2010). *The high cost of low educational performance*. Author.

Organisation of Economic Co-operation and Development [OECD]. (2012). *Education at a glance, 2012*. OECD. Retrieved from www.oecd.org/edu/EAG%202012_e-book_EN_200912.pdf

Organisation of Economic Co-operation and Development [OECD]. (2013a). *PISA 2012 results. What students know and can do: Student performance in reading, mathematics and science* (Vol. I). Retrieved from http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-I.pdf

Organisation of Economic Co-operation and Development [OECD]. (2013b), PISA *2012 Results: Ready to learn – Students' engagement, drive and self-beliefs* (Volume III), PISA, OECD Publishing. http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-III.pdf

Pierce, J. R., & Schott, P. K. (2012). The surprisingly swift decline of U.S. manufacturing employment. Yale School of Management and National Bureau of Economic Research. Retrieved from http://economics.yale.edu/sites/default/files/schott-09-oct-2013.pdf

Prestowitz, C. (2012, February 22). GE's competitiveness charade. *Foreign Policy*. Retrieved from http://prestowitz.foreignpolicy.com/ posts/2012/02/22/ ges_competitiveness_charade 5

Prestowitz, C. (2013, May 9). Triumph of the mercantilists. *Foreign Policy*. Retrieved from http://prestowitz.foreignpolicy.com/ posts/2013/05/09/ triumph_of_the_mercantilists

UNICEF Office of Research. (2013). *Child well-being in rich countries: A comparative overview*. Innocenti Report Card 11, UNICEF Office of Research, Florence. Retreived from http://www.unicef-irc.org/publications/pdf/rc11_eng.pdf

Ringmar, S. (2013, December 28). Here's the truth about Shanghai schools: They're terrible. *The Guardian*. Retrieved from http://www.theguardian.com/commentisfree/2013/dec/28/shanghai-china-schools-terrible-not-ideal

Ruiz, N. G., Wilson, J. L., & Choudhury, S. (2012). The search for skills: Demand for H-1B immigrant workers in U.S. metropolitan areas. Brookings. Retrieved from http://www.brookings.edu/~/media/research/files/reports/2012/7/18%20h1b%20visas%20labor%20immigration/18%20h1b%20visas%20labor%20immigration.pdf

Rural Education Action Program. (2013a). Keeping kids in school. Stanford University. Retrieved from http://reap.stanford.edu/docs/research_projects__keeping_kids_in_school

Rural Education Action Program. (2013b). Money for matriculation: REAP Brief #114. Stanford University. Retrieved from http://iis-db.stanford.edu/pubs/23435/REAP114-EN.pdf

Shanghai.gov. (2013). Regular education. Author. Retrieved from http://www.shanghai.gov.cn/shanghai/node17256/node17432/node17446/userobject22ai22041.html

Sjøberg, S. (2012). PISA: Politics, fundamental problems and intriguing results [English trans.]. *La Revue, Recherches en Education, 14*, 1–21. Retrieved from http://www.scienceinpublic.com.au/blog/wp-content/uploads/Svein-Sjoberg-PISA-tests_La-Revue_no14-Sept-2012.pdf

Stewart, W. (2013, July 31). Is PISA fundamentally flawed? *TES* magazine. Retrieved from http://www.tes.co.uk/article.aspx?storycode=6344672

Snyder, T. D., &Dillow, S. A. (2012). *Digest of education statistics 2011*. (NCES 2012-001). Washington, DC: U.S. Department of Education, National Center for Education Statistics, Institute of Education Sciences.

Thibodeau, P. (2009, December 14). List of H-1B visa employers for 2009. *Computer World*. Retrieved from http://www.computerworld.com/s/article/9223745/The_top_10_H_1B_visa_users_in_the_U.S.

Thomson Reuters. (2011, August 31). ScienceWatch: Top 20 countries in all fields, 2001. New York, NY: Author. Retrieved from http://archive.sciencewatch.com/dr/cou/2011/11decALL

Tienken, C. H. (2008). Rankings of international achievement test performance and economic strength: Correlation or conjecture? *International Journal of Education Policy and Leadership, 3*(3), 1-12.

Tienken, C. H. (2011). The Common Core State Standards: An example of data-less decision making. *AASA Journal of Scholarship and Practice, 7*(4), 3-18.

Tienken, C. H. (2013a). International comparisons of creativity and innovation. *Kappa Delta Pi Record, 49*, 153-155

Tienken, C. H. (2013b). Conclusions from TIMSS and PISA testing. *Kappa Delta Pi Record, 49*(2), 56-58.

Tienken, C. H. (2013c). What PISA says about PISA. Retrieved from www.christienken.com

Tienken, C. H., & Orlich, D. C. (2013). *The school reform landscape: Fraud, myth, and lies*. New York, NY: Rowman and Littlefield.

Traywick, C. A. (2013, November 5). Here's proof that trading with Beijing is screwing America's workers. *Foreign Policy*. Retrieved from http://blog.foreignpolicy.com/posts/2013/11/05/heres_proof_that_trading_with_china_is_screwing_american_workers

U.S. Department of Homeland Security. (2006). Report on H-1B petitions. U.S. Citizenship and Immigration Services. Retrieved from http://www.uscis.gov/sites/default/files/USCIS/Resources/Reports%20and%20Studies/h1b04annual_08_7.pdf

U.S. Department of Commerce, Bureau of Economic Analysis. (2012). Summary estimates for multinational companies: Employment, sales, and capital expenditures for 2010. Author. Retrieved from http://bea.gov/newsreleases/international/mnc/2012/mnc2010.htm

U.S. Patent and Trademark Office. (2012). Patents by country, state, and year: Utility patents. Alexandria, VA: Author. Retrieved from http://www.uspto.gov/web/offices/ac/ido/oeip/taf/cst_utl.htm - See more at: http://christienken.com/2013/12/05/what-pisa-says-about-pisa/#sthash.huXjlZ6u.dpuf

World Bank. (2012). Poverty headcount ratio at $2 a day (PPP). Author. Retrieved from http://data.worldbank.org/indicator/SI.POV.2DAY

Zhao, Y. (2012). *World class learners. Educating creative and entrepreneurial students.* New York, NY: Corwin Press.

Commentary

The Influences and Implications of PISA: An Australian Perspective

Karen Starr, PhD
Inaugural Chair, School Development and Leadership
Faculty of Arts and Education
Deakin University
Burwood, VIC 3125, Australia

Abstract

This article is a commentary on Australia's involvement in the Programme for International Student Assessment (PISA) tests. It provides a rationale for Australia's participation in the PISA programme, the influences of PISA involvement on education policies and practices, and considerations and implications for school leaders and education researchers. It provides commentary on the positive and negative aspects of PISA involvement and concludes that there are many more disadvantages than benefits, each of which is explained. The article has applicability across the many standardized testing programmes to which Australian students are subjected. Furthermore, the Australian experience and this perspective may hold resonance for colleagues in countries with similar education systems, policies, and standardized testing regimes.

Key Words

PISA, standardized testing, Australian education.

This article provides an Australian perspective on the PISA (Programme for International Student Assessment) tests. In particular, the article provides a rationale for Australia's participation in the PISA program, the positive and negative influences of PISA involvement, and considerations and implications for school leaders and educational researchers.

While focusing on the PISA tests, the article has applicability across the many standardized testing regimes to which Australian students are subjected. PISA is highlighted, however, because a policy aim of the recently deposed Gillard Labor federal government was to raise Australian education standards such that the nation would appear amongst the top five countries as determined by PISA testing. In general terms, however, the Australian experience and this perspective may hold resonance for colleagues in countries with similar education systems, policies, and standardized testing practices.

PISA and Rationale for Australian Involvement

PISA evaluates participating education systems worldwide by testing a randomly chosen sample of 15-year-old students in mathematics, science, and reading. Introduced by the Organization for Economic Cooperation and Development (OECD), PISA assesses students' application of skills and understandings learnt during the compulsory years of schooling and aims to provide comparative data to assist education policy making and benchmarking.

In 2009 there were approximately 26,000,000 eligible 15-year-olds in the 73 countries and economies (which includes cities) participating in PISA, with 470,000 students undertaking the tests, which represents a sample of 1.8 per cent across the globe.

Assessment tasks included multiple-choice questions and problems requiring students' own responses.

It is no surprise to learn that comparative measurement tools such as PISA have arrived at a time when the emphasis on student learning outcomes is increasing. There are many interconnected reasons as to why this is the case.

Globalization has intensified international economic competition, with governments wanting to increase national productivity and efficiency via a well-educated, innovative workforce and citizenry.

In Australia, education is seen to play a major role in enhancing the nation's productivity potential (Productivity Commission, 2013). Globalization has also fueled the internationalization of schooling, including the enrolment of full-fee paying international students and a concomitant movement of students and teachers across the globe.

Besides being used as a barometer of Australia's schooling effectiveness compared with other nations and major cities, international test scores also assist potential international students to make choices about where to study. This latter justification is significant in Australia, where education is the nation's third largest export earner, and for states like Victoria education is its largest income earner. Education is big business!

The economic structural reforms that have occurred progressively since the Reagan/Thatcher era have been fully embraced by Australian governments ever since, irrespective of their political hue. The shift from Keynesian economics to a free market

economy heralded attendant shifts in social policy, with a social democratic policy agenda making way for neo-liberal policy values corresponding with the laissez-faire economic stance.

Policy values highlighted small government, efficiency, flexibility, sovereign individualism, public choice, market competition, entrepreneurialism, user-pays efficiencies, local decision-making, quality assurance, continual improvement, and accountability.

In this context, both governments (state and federal) and education "consumers" (parents and students) required greater transparency and more information to aid choice and accountability in autonomous, locally managed schooling arrangements. In Australia, public choice and market competition have been aided by the introduction of the *My School* website which provides comparative data about every school in the nation.

The neo-liberal shift to small government entailed previously centralized tasks being transferred to the local school level. As a result, there has been a significant change in the nature of school leadership since the 1990s.

The policy shift to self-managing schools and small government brought about increasing workloads for schools and rising demands for accountability, while governments' expectations about the return on education investment also intensified. Any spending increases needed to translate into greater "quality" (never defined), higher standards, and improved student learning outcomes.

Hence, although schools are self-managing, they are under increasing scrutiny and surveillance through numerous compliance, regulatory, accountability, and audit regimes.

The introduction of standardized testing served not only as a means of measuring school success, but also as a way of comparing schools and schooling systems with the assumption that this would spur competition between them, thereby promoting improvement, entrepreneurialism, and innovation.

Through this period there has been a growing consensus that it is no longer acceptable for some students to fail in school, unlike the past where it was acknowledged that some less successful students would drop out of schooling.

Schools are now charged with finding each student's strengths, interests, and learning needs. Policies demand individualized programming ("individuation") to ensure each student succeeds and realizes his or her highest learning potential.

Furthermore, schools are being held to account for statements on their websites and in their policy documents through litigation, adding emphases to transparency and new accountabilities to a broad range of stakeholders.

A further factor contributing to the increasing emphasis on student learning outcomes is the politicization of education, with education policy being a major electoral bargaining chip, alongside "bad" press leveled at educators and schools as a legitimation exercise, giving the impression that Australian education is in a perpetual state of crisis.

Standardized test scores, especially international scores, are seen as measures of how the country is performing against economic competitors. For example, commentators opined that Australia "was one of only five countries, and the only high performing nation, to record a decline" in recent PISA scores (Harrison, 2012, p. 1).

In 2012, then Prime Minister Julia Gillard commented on Australia's poor PISA showing in comparison with Asian neighbors to the north, saying that Australia was "in danger of losing 'the education race' to its regional neighbors, four of which – Shanghai, South Korea, Hong Kong, and Singapore – make up – with Finland – the top five systems in the PISA tests" (Harrison, 2012, p. 2).

A final reason for Australia's participation in PISA could simply be that most other competitor countries are involved; that is, a large number of respected countries are engaged in PISA testing (including all advanced economies), and hence evading participation could be construed as national defensiveness or self-doubt.

If such a proposition holds a grain of truth, then PISA participation may represent membership in an international "club" that currently holds currency and credibility.

Besides the reasons behind PISA participation, there are some positive reasons behind Australia's involvement, but only a very few. In my view, these are far outweighed by their negative impact, as discussed below.

Benefits and Disadvantages of PISA Testing

The PISA tests are said to provide evidence of improvement or deterioration in student learning over time, place, and school context (OECD, 2010). Test results are indicative of progress over time; for example, performance in one year compared to the next across schools of similar type, performance of one school compared to a school with similar attributes or in the same geographical area or of changes in light of new policies, practices, or personnel, and performance as a result of a school implementing new pedagogical practices.

Such data is very useful and provides evidence for introspection and educational praxis, with theory and practice viewed as essential in informing each other (Grundy, 1987). Hence, PISA test results can be diagnostic and helpful in teaching and learning processes.

We also know there is always room for improvement in every human enterprise, with none being more important than education. Test participation provides information on which decisions for improvement can be made with the aim of achieving higher outcomes.

A further benefit, some believe, is that we owe it to students to make them aware of their true learning abilities and not to mollycoddle them through concerns about their self-esteem, luring them into a false sense of security if they are failing (Ng & Earl, 2008; Loveless, 2006; see also Chua, 2011). In other words, students and parents should not be shielded from factual assessments of a child's performance and how these compare with those of counterparts of the same age.

Education departments regularly introduce new curriculums or promote particular pedagogical practices. For example, in Australia current emphases are individualized programming for every student, interdisciplinary learning, and teacher teams working intensively with a group of students in newly designed learning facilities catering to

all curriculum areas, with students pursuing different activities--individually, in small groups, or working intensively with a teacher. It is conceivable that governments would want some independent measures by which to gauge the impact of such radical curricular and pedagogical changes. PISA tests might be one such indicative measure (OECD, 2010, 2012, 2013; Schleicher, 2013).

Despite these advantages, however, extant research literature suggests there are many reasons why PISA and other forms of standardized testing should be viewed with skepticism.

A common criticism is that the information derived from testing instruments adds little to what teachers already know. Teachers know what students know and can do and what they cannot. Teachers know what students must do to improve.

In this sense instruments like PISA de-professionalize and de-skill teaching, with test data being privileged above teacher knowledge (McNeil, 2000). Valorizing "point in time" test results above teachers' professional judgments is wasteful and disrespectful.

A second common criticism is that tests do not account for the contextual differences that create educational advantage or disadvantage. Schools often perform at levels that are indicative of the level of social capital they have available to them in the local community.

Over decades, educational research has demonstrated that students may be advantaged or disadvantaged at school depending on their home circumstances (Connell, Ashenden, Kessler, & Dowsett, 1982). League tables provide stark academic distinctions between advantaged and disadvantaged students. Many factors such as socioeconomic background, household functionality, physical disability, language proficiency, or geographical location influence schooling outcomes. Polesel, Dulfer, and Turnbull (2012) argue that standardized testing has a disparaging impact on some students, some schools and some communities, which is unconscionable when it comes to educating the nation's children and young people.

We assume that education should be an "equalizer."

> The OECD (2010, p. 13) admits that: Home background influences educational success, and schooling often appears to reinforce its effects. Although poor performance in school does not automatically follow from a disadvantaged socioeconomic background, the socioeconomic background of students and schools does appear to have a powerful influence on performance.

Hence, students from low socio-economic backgrounds tend to achieve lower test scores than their advantaged counterparts.

In light of this acknowledgment PISA tests occur alongside a questionnaire delivered to students and principals to extract local information. However, in Australia these data are seldom the focus of national media and rarely acted upon by education systems on the basis of test results.

On the contrary, poorly performing schools can be punished for their failure (Ball, 1994). A telling example was that former Prime Minster Kevin Rudd threatened to close failing schools and sack their principals through his

government's "Education Revolution" (Grattan, Tomazin, & Harrison, 2008; Reid, 2009), despite the fact that constitutionally education is a state-based issue in Australia, not a federal preserve.

The media "beat up" on schools, educators, and education policy has led to a regular public endorsement of calls for a "back-to-basics"/"no frills" policy stance at the same time as enormous pressures are being brought to bear to expand the curriculum to solve a range of social woes from road safety to consumer literacy. Hurst (2013, p. 1) refers to this as "a vision of the future-– grounded in the past."

PISA tests target only certain areas of the curriculum and only certain elements within those curriculum areas. They foster a "core and options" basis for curriculum, revering mathematics, science, and reading above other areas of knowledge, which suits some students and their interests more than others.

This reversion to a "core and options" curriculum model has displaced equal weighting provided in all curriculum areas in the compulsory years of schooling, which may disenfranchise students whose talents reside in the arts, humanities, languages, sports, or physical education, for example. In this way the interests and learning strengths of all students are less likely to be catered to.

There have been criticisms about teachers "teaching to the test" and thereby narrowing the curriculum (Phelps, 2011; Polesel et al., 2012), of schools encouraging slow learners to be absent for high stakes tests in order to avoid lower aggregated school scores (ACARA, 2012; Topsfield, 2012), and there are even teachers' guides (Thomson, Hillman, & De Bortoli, 2013a, 2013b, 2013c) and test preparation texts available to yield a head start.

For all the reasons above, PISA testing hardly occurs on a "level playing field."

At the macro level, PISA sample sizes for any country are too low to make judgments about entire education systems (as mentioned earlier, only 1.8 per cent of eligible students sit for PISA tests across the world).

To fulfill OECD requirements, each country must draw a minimum sample of only 5,000 students—statistically, in most cases, a very small percentage of the total number. It is also unlikely that across the world students are studying the same material at the same ages and grade levels. Furthermore, test results do not indicate how improvements can be made.

PISA testing regimes are costly in terms of their development, administration, analysis, and reporting. The funds used to participate in tests could likely be better spent on teachers or learning resources closer to students and more attuned to their learning needs.

Where Should Focus Be In Terms of Student Learning Outcomes?

No one would dispute the need for a fundamental educational grounding in the "3 R's." Literacy and numeracy are basic learnings that everyone would expect of any education system.

When parents are asked what they want from schools, the "3 R's" are the most commonly cited need.

However, parents also want their children to be happy at school, to feel connected and not excluded or alienated by schooling processes (Starr, 2014, forthcoming;

Zeehandelaar & Northern, 2013). While some parents may seek high-test score results, most prefer their children to experience the joy of learning to become lifelong learners.

They want skills that enhance employability, citizenship, acceptance of cultural diversity, and creativity (Zeehandelaar & Northern, 2013).

Employers seek thinking skills, both analytical and critical. They want future employees to be able to apply interdisciplinary knowledge to real world problems, to demonstrate capacity for teamwork, to take personal initiative, to possess competent IT skills, intercultural understandings, and a "can-do" attitude (Career NZ, 2013); and it is assumed that these are developed in schools.

Further, schools that successfully engage students achieve the highest rates of retention and attendance. In sum, the community wants students to receive a well-rounded education that values all fields of knowledge and that recognizes and builds on students' strengths and interests in addition to providing a range of cross-curricular social learnings.

This is the antithesis of the focus of standardized tests such as PISA, yet the prominence they receive from governments elides so much of what schools do and what communities expect from education.

The OECD (2010) suggests there are factors that high performing and rapidly improving education systems have in common.

First, high performing nations are clear about their commitment to education, with citizens valuing education above other things. In the world's highest performing countries, therefore, students study longer and harder in order to achieve at school rather than spending time with friends or in recreational activities outside of school.

Second, high achieving education systems set high standards and expectations that are accepted across the education system with a focus on higher order thinking skills. Students are encouraged to succeed and do not progress through grade levels until they have mastered the requisite learning in each grade.

Third, and most importantly, these education systems emphasize the quality of teachers and principals. Teachers are respected and importance is placed on teacher recruitment, training, induction, mentoring, professional learning, and compensation. Such education systems have more autonomy at the school level with discretion over resource allocation, staff deployment, work organization, and school procedures. Traditional centralized "command and control" systems have made way for local management and accountability arrangements. Teachers work together to determine good practices and use research as evidence of the effectiveness of the approaches adopted.

Last, the most successful countries invest more money in education to make a difference for all students. They prioritize quality within teaching and use their most talented teachers for the most challenging classrooms (Harrison, 2012). Experience in challenging circumstances is a criterion for career progression as is peer-reviewed research, while the most resources are provided to socioeconomically disadvantaged schools. Systemically, there are high expectations for the success of every student and for the delivery of excellent learning opportunities.

Currently, countries such as Finland, Japan, Korea, and Canada and cities such as

Hong Kong and Shanghai all perform above the OECD mean performance level. These education systems have few students at lower proficiency levels (OECD, 2010).

While many of the attributes mentioned above could be said about the Australian education system, many do not accord with schooling reality; thus, there is much to be learnt, even though Australia actually achieves within the top ten countries each year.

Implications for Educational Leaders

While schools should take notice of PISA and other standardized test results, they are not the "be all and end all."

Schools should concentrate on their actual needs, collecting data from within the school to demonstrate improvements that have occurred, some of which may not relate to the formal curriculum (such as increased retention, attendance, sense of belonging, intercultural harmony, and integration of students with disabilities). Data on all forms of improvement are useful for accountability, annual reporting, and school leaders' performance appraisals.

Leaders should account for all improvements and use them as an internal gauge of performance and for their own public relations and accountability exercises, rather than relying on external, narrow measurements and priorities.

Schools have an obligation to base improvement activities on students' actual learning needs. Schools are always a work in progress and in a state of becoming. They are never perfect and needs and priorities change over time. The main concerns of the current principal will be different from that of predecessors and will be different again from those of successors. Hence, school leaders and governors need their prime focus to be on the stewardship of their school with its current needs, priorities, and desired initiatives.

I would argue most emphatically for a re-thinking of educational leadership whereby the profession takes responsibility for establishing systemic educational directions, needs, and priorities. Educational leaders should question why tests such as PISA are necessary, have the influence they do, and also question the purposes to which the data are put and ask, "Who wants to know and why?"

While the immediate school context is the prime focus, there is also a need to extend the purview beyond the school gate, beyond that of the local community, the state, and the nation.

As educators, there should be a concern for the education of the world's children and young people in general.

It is an indictment that the world is nowhere near reaching the millennium goal of primary school completion as a minimum level for all the world's children.

It is shameful that only wealthy countries can afford to participate in the PISA and that the countries that do are more concerned about out-ranking one another than they are about giving the children in less affluent circumstances the assistance required to receive a basic education.

Every Australian state and education authority has developed educational leadership standards over recent years (DEECD, 2007). These are usually presented as developmental learning frameworks to build school leadership capacity from aspirants and beginners, through mid-career, to very experienced and successful school leaders. At the highest standards of leadership, these frameworks suggest that

school leaders take responsibility for their profession and extend their leadership through networks and associations to reach schools and students beyond their immediate institutional responsibilities.

These higher levels of school leadership are seldom commented upon and are rarely a focus for performance appraisals.

However, "bad" education policy should be addressed and challenged rather than tolerated.

The most effective school leaders and practitioners should make it a priority to educate adults--the parents in their school communities, the politicians, the fourth estate, and the commentariat—about what really matters in education, what should and should not be done, while providing data about the effectiveness of home-grown practices that demonstrate student learning improvements in a variety of areas.

There is also a case for turning beliefs and statistics to the advantage of schools rather than have them held up for more criticism.

For example, the OECD argues that teachers are generally weak in skills that are required for the 21st century, most notably ICT skills (Ananiadou & Claro, 2009, p. 6). Then why is funding not forthcoming for this critical area of professional need? (Perhaps testing funding could be diverted through reprioritization.)

From equity and professional perspectives and using sheer common sense, PISA is divisive rather than ameliorative, encouraging competition rather than collaboration and delivering many more negatives than benefits. PISA is esteemed as a form of legitimate global research, yet the valid findings of equity-focused educational research is marginalized in its wake.

School leaders and their professional associations have a role in advocating on behalf of education and educators, for learning in its broadest sense, and for all children, everywhere. PISA is a sideshow that is taking attention away from the main game and disproportionately influencing education policy and practice to the detriment of Australian students.

Author Biography

Karen Starr, PhD, FAICD, FACE, FACEL, FIEDRC, is professor and inaugural chair of school development and leadership at Deakin University, Australia. Email: kstarr@deakin.edu.au

References

Ananiadou, K., & Claro, M. (2009). *21st century skills and competencies for new millennium learners in OECD countries. (OECD Education Working Paper No. 41)*. Paris, France: OECD. Retrieved from http://dx.doi.org/10.1787/218525261154

Australian Curriculum, Assessment, and Reporting Authority. (2012). *Report of 2012 NAPLAN Test incidents*. Retrieved from http://www.acara.edu.au/verve/_resources/2012_NAPLAN_TEST_INCIDENTS_REPORT_website_version.pdf

Ball, S. (1994). *Education reform: A critical and post-structural approach*. Buckingham, UK: Open University Press.

Creer NZ. (2013). *Skills employers are looking for*. Retrieved from http://www.careers.govt.nz/plan-your-career/not-sure-what-to-do/skills-employers-are-looking-for/

Chua, A. (2011). *Battle hymn of the tiger mother*. New York, NY: Penguin.

Connell, R. W., Ashenden, D. J., Kessler, S. and Dowsett, G. W. (1982). *Making the difference: Schools, families and social division*. North Sydney, NSW: Allen and Unwin Pty Ltd.

Department of Education, Victoria. (2007). *The developmental learning framework for school leaders*. Melbourne, Victoria: Government of Victoria. Retrieved from http://www.education.vic.gov.au/Documents/school/principals/profdev/developmentallearn.pdf

Grattan, M., Tomazin, F., & Harrison, D. (2008, August 28). School v school: PM's rule. *The Age*, p. 1.

Grundy, S. (1987). *Curriculum: Product or praxis?* New York, NY: Routledge.

Harrison, D. (2012, February 17). A class above. *The Sydney Morning Herald.* Retrieved from http://www.smh.com.au/national/a-class-above-20120216-1tbq7.html

Hurst, D. (2013, September 28). Back to basics. *The Age*.

Loveless, T. (2006). *The 2006 Brown Center report on American education: How well are American students learning?* Washington, DC: The Brookings Institution.

McNeil, L. M. (2000). *Contradictions of school reform: Educational costs of standardized testing*. New York, NY: Routledge.

Ng, J. R., & Earl, J. K. (2008, Spring). Accuracy in self-assessment: The role of ability, feedback, self-efficacy and goal orientation. *The Australian Journal of Career Development*, ACER, 17(3), 39-50.

Organization for Economic Cooperation and Development. (2010). *PISA 2009 Results: Overcoming social background, Volume 11*. Paris, France: OECD.

Organization for Economic Cooperation and Development. (2012). *PISA 2012: Assessment and analytical framework*. Paris, France: OECD.

Organization for Economic Cooperation and Development. (2013). *Education at a glance*. Paris, France: OECD.

Phelps, R. (2011, Autumn). Teach to the test. *The Wilson Quarterly*. Retrieved from http://www.wilsonquarterly.com/essays/teach-test

Polesel, J., Dulfer, N., & Turnbull, M. (2012). *The experience of education: The impacts of high stakes testing on school students and their families.* Rydalmere, NSW: Whitlam Institute, The University of Western Sydney.

Productivity Commision. (2013, May). *Productivity update.* Canberra, ACT: Productivity Commission, Australian Government.

Reid, A. (2009). Is this really a revolution? A critical analysis of the Rudd government's national education agenda. *Curriculum Perspectives*, 9(3), 1-13.

Schleicher, A. (2013). Value of education in crisis but investment in it falls. (Video file). Retrieved from http://www.youtube.com/watch?v=ltABYOs6CZo&list=PL96BBC83DFCD8447E&index=5

Sheehan, P. (2012, September 6). Race up the rankings is really a class issue. *The Sydney Morning Herald*. Retrieved from http://www.smh.com.au/federal-politics/political-opinion/race-up-the-rankings-is-really-a-class-issue-20120905-25emt.html

Starr, K. (2014, forthcoming). *Education game changers: Global policy paradox and implications for educational leadership, business, and governance*. Lanham, MD: Rowman Littlefield Publishers.

Thomson, S., Hillman, K., & De Bortoli, L. (2013a). *A teacher's guide to PISA reading literacy*. Camberwell, Victoria: ACER Press.

Thomson, S., Hillman, K., & De Bortoli, L. (2013b). *A teacher's guide to PISA mathematical literacy*. Camberwell, Victoria: ACER Press.

Thomson, S., Hillman, K., & De Bortoli, L. (2013c). *A teacher's guide to PISA scientific literacy*. Camberwell, Victoria: ACER Press.

Topsfield, J. (2012, January 18). Schools found cheating on national tests. *The Age*. Retrieved from http://www.theage.com.au/national/schools-found-cheating-on-national-tests-20120117-1q4lm.html

Zeehandelaar, D., & Northern, A. M. (2013). *What parents want: Educational preferences and trade-offs*. Thomas B. Fordham Institute. Retrieved from http://www.edexcellence.net/publications/what-parents-want.html

Commentary

What Does the International PISA Math Test Really Tell Us?

Jerome Dancis, PhD
Associate Professor Emeritus
Department of Mathematics
University of Maryland
College Park, MD

Abstract

The Organization for Economic Cooperation and Development [OECD] is a global policy organization that includes the United States and about half of the Western Europe countries. It administers international comparison tests, called Programme for International Student Assessment (PISA), for 15 year-old students in Mathematics and other subjects. I present what I believe the PISA mathematics results really tell us. Among other things, the results suggest that students need more instruction in multi-step Arithmetic word problems and more practice with Arithmetic calculations. Also, students should not be rushed in Algebra in Grade 8. The results suggest that PISA is not a valid measure of the overall quality of mathematics achievement in a country. PISA mathematics largely avoids measuring Arithmetic calculations.

Key Words

PISA, math achievement, global competitiveness

Introduction

The December 18, 2013 New York Times editorial, "Why Other Countries Teach Better: Three Reasons Students Do Better Overseas," discussed the findings of the 2013 PISA report.[i]

The author argues that, "… Finland has for years been in the highest global ranks in literacy and mathematical skills." "… [Finnish] schools stand out in several ways, providing daily hot meals; health and dental services; psychological counseling; and an array of services for families and children in need." "… But the most important effort has been in the training of teachers," "… The country decided to move preparation out of teachers' colleges and into the universities, where it became more rigorous."

As a Finnish university professor noted, "PISA test items are measuring the achievements of everyday life mathematics … [with no need for students] to learn mathematics as a structure. We do know in Finland that we wouldn't get any success in PISA, if the test items were related to the understanding of mathematical concepts or relations."[ii]

Finnish college faculty complain about the low knowledge of arithmetic and simple Algebra of Finnish college students. I discuss this further at the end of the article.

Yes, U.S. schools should provide daily hot meals; health and dental services; psychological counseling; and an array of services for families and children in need. We should do this because it makes good sense; not because Finland is doing it.[iii]

Yes, we would have higher quality teachers, if we followed Finland and closed ineffective teacher preparation programs that are not of high quality.[iv] Again, we should do this because it makes good sense, not because Finland has done it.

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[i] http://www.nytimes.com/2013/12/18/opinion/why-students-do-better-overseas.html?ref=opinion&_r=0 A rare page-length editorial.

[ii] "PISA Results and School Mathematics in Finland: strengths, weaknesses and future" http://math.unipa.it/~grim/21_project/21_charlotte_MalatyPaperEdit.pdf

[iii] Education policy expert, Richard Rothstein has advocated this for years. Several cities have starting doing these worthy things in poor neighborhoods. In my county, it is called "wrap around services."

[iv] "A recent report by the National Council on Teacher Quality called teacher preparation programs an industry of mediocrity," rating only 10 percent of more than 1,200 of them as high quality. Most have low or no academic standards for entry. (Also addressed in the New York Times editorial.) The inadequate preparation in mathematics of future elementary school teachers by 67 of the 77 colleges surveyed is documented in the National Council on Teacher Quality (NCTQ) report, "No Common Denominator: The Preparation of Elementary Teachers in Mathematics by America's Education Schools [NOT]," (June 2008). It is at www.nctq.org/p/publications/reports.jsp

Additionally, the states could implement the recommendations of the U.S. Dept. of Education's National Mathematics Advisory Panel that teacher preparation programs and licensing tests for all K-8 mathematics teachers should require that teachers understand arithmetic.[v]

As U.S. Secretary of Education Arne Duncan said:

> "And when you get to sixth, seventh, and eighth grade, we see lots of students start to lose interest in math and science. And guess why? It's because they're taught by teachers that don't know math and science."

And so, I agree, we can use a ton of these resources to send teachers back to school, to universities, "... to get the content, the knowledge they need to be able to teach." [vi]

For elementary school teachers, Massachusetts led the way in 2009, as the first state to have a specific licensing test in mathematics. It was common for states to have a licensing test in mathematics for middle school and high school teachers of mathematics. All but four states have licensing tests for elementary school teachers, but before 2009, applicants weak in math could skip most of the math questions and pass by answering enough questions on history, English, pedagogy etc.

As of 2012, between ten and twenty states require elementary school teacher applicants to obtain a separate passing score on math content.

What Do Results From PISA Math Really Tell Us?

Students need instruction in multi-step arithmetic word problems. Do not rush students into Algebra I in Grade 8. I demonstrate this by examining the following math question showcased [vii] by PISA. PISA rates this question as a Level 5 on its scale of 1-6 (Easiest is Level 1).[viii]

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[v] Its report was rigorously researched. It is at www.ed.gov/about/bdscomm/list/mathpanel/report/final-report.pdf

[vi] This answer was Duncan's answer to my question. See Pages 15 and 16 at: http://www.brookings.edu/~/media/Files/events/2009/0511_duncan/20090511_education.pdf

[vii] Starting at this page, http://www.oecd.org/pisa/test/form OECD lets you try 6 questions, rated from Level 1 to Level 6. (You have to view them in order.) After trying or choosing a random answer, OECD provides its usually pretentious and misleading description of the level and category of the problem. OECD also provides the percentage of students, by country, which scored at the various levels.

[viii] Page 49 http://www.oecd.org/pisa/pisaproducts/PISA%202012%20framework%20e-book_final.pdf

PISA question: Climbing Mount Fuji

The Gotemba walking trail up Mount Fuji is about 9 kilometres (km) long. Walkers need to return from the 18 km walk by 8 p.m. Toshi estimates that he can walk up the mountain at 1.5 kilometres per hour on average, and down at twice that speed. These speeds take into account meal breaks and rest times. Using Toshi's estimated speeds, what is the latest time he can begin his walk so that he can return by 8 pm?

The PISA description for solving this question is: Calculate the start time for a trip given two different speeds, a total distance to travel and a finish time.[ix]

Students must calculate the following to answer the question correctly:

{Speed down} = 2 x {Speed up} = 2 x 1.5 = 3 km/hour

{Return Travel time} = d/s = 9/3 = 3 hours.

Since {Speed down} = 2 x {Speed up}; {Time up} = 2 x {Time down} = 2 x 3 = 6.

{Start time} = {finish time} – {total travel time} = 8 PM – (6 + 3) = 11 AM.

About one in eight (12%) of all students who had this question on their PISA test answered this question correctly.[x]

The bulk of students should be solving this basically, straight forward four-step problem. Although, as PISA notes: "but it requires sustained accuracy." Yes, sustained accuracy is very important, but textbooks provide little opportunity for students to develop and practice sustained accuracy. More important, problems like these require first being able to read and fully comprehend the problem. Then students must break the problem into parts, where each part requires only simple calculations. This calls for instruction in solving straight-forward four-step problems. But, four-step problems rarely appear in textbooks. So students have little or no practice with such problems. Textbooks, not students or teachers, deserve the blame.

PISA notes "The mathematisation required [involves aspects of] understanding how meal times are already included [from the sentence *these speeds take into account meal breaks and rest times*] and even that the trail will first be up and then separately down. The representation demand is minimal, with only the interpretation of text required … all the calculations are relatively simple."[xi]

[ix] Page 20 of PISA 2012 RELEASED MATHEMATICS ITEMS: http://www.oecd.org/pisa/pisaproducts/pisa2012-2006-rel-items-maths-ENG.pdf

[x] Page 49 With 61% wrong answers and 27% omissions: http://www.oecd.org/pisa/pisaproducts/PISA%202012%20framework%20e-book_final.pdf

[xi] Page 49 http://www.oecd.org/pisa/pisaproducts/PISA%202012%20framework%20e-book_final.pdf

PISA rates this as a difficult Level 5 question. But, *where* is the difficulty in doing this problem? Roughly one in ten students from the United States as well as students from Western European countries [OECD] scored at the highest Levels 5 and 6, compared to four in ten students from Singapore. (These numbers apply to the Level 5 questions collectively, not to this particular "Climbing Mount Fuji" question.)

A major reason that students from Singapore do so much better on multi-step arithmetic word problems is that they receive considerable education and training in them from Grade 4. None of the released PISA questions are as sophisticated as the following problem from a Grade 4A (Singapore) Math Primary Mathematics textbook:

Question 2

David spent 2/5 of his money on a storybook. The storybook cost $20. How much money did he have at first?

A simple arithmetic solution appears in "Solving Algebra and Other Story Problems with Simple Diagrams: a Method Demonstrated in Grade 4–6 texts used in Singapore."[xii] Do we need PISA to inform us that American students need more instruction in multi-step problems? No! Just look at this National Assessment of Educational Progress [NAEP] problem:

Problem 3

There were 90 employees in a company last year. This year the number of employees increased by 10 percent. How many employees are in the company this year?

[Multiple Choice] A) 9 B) 81 C) 91 D) 99 E) 100

Solution: 10% is 1/10. A tenth of 90 is 9. Total employees are 90 + 9 = 99

This should be an easy problem for fifth or sixth graders. But, nationally, less than *half* of eighth-graders, who studied Algebra I or above, answered correctly.[xiii] Students who cannot solve problems like Problem 3 in Grade 7 should be studying multi-step arithmetic word problems in Grade 8, not Algebra. Students who cannot solve Problem 3 in Grade 8 will be at-risk in a rigorous high school physics course.

[xii] http://math.coe.uga.edu/tme/issues/v14n1/v14n1.Beckmann.pdf

[xiii] http://www.brookings.edu/brown.aspx

What Does PISA Math *Not* Tell Us?

Students need instruction and practice in arithmetic and Algebra I calculations. Students need the opportunity to develop "number sense." Do not rush students into Algebra I in Grade 8. Some American and Finnish Grade 8 students *cannot* subtract fractions.

Problem (TIMSS-2011[xiv]):

Which shows a correct method for finding 1/3 - 1/4?

A (1 – 1)/(4 – 3) B 1/(4 – 3) C (3 – 4)/3 D (4 – 3)/(3*4)

Percentage of correct answers (D) for Grade 8 students:

U.S. students	29%,
Singapore	83%
Finland	16%
Mass.	44%

Sixth graders should be fluent in adding and subtracting fractions. Students unable to add fractions in Grade 7 should be studying fractions in Grade 8, not Algebra.

Students *not* fluent in adding fractions are *not* ready for a rigorous pre-Algebra course. Subtracting fractions is *not* in the high school math curriculum. Grade 8 students who *cannot* subtract fractions will become at-risk students in a rigorous high school physics course. They are on track for remedial Algebra I, if not remedial arithmetic, when they attend college.

The National Council of Teachers of Mathematics (NCTM) prescribed *decreased* attention to fractions. The 1989 NCTM Standards state: "This is not to suggest that valuable time should be devoted to exercises like (17/24) + (5/18) or 5 3/4 x 4 ¼ … Division of fractions should be approached conceptually." Writers of textbooks and state assessments have followed this advice. [xv]

Professors of mathematics, Guershon Harel and W. Stephen Wilson noted in "The State of High School [Math] Textbooks:" We found ... a deliberate avoidance of symbolic manipulation in algebra ... in high school math textbooks.[xvi] An example of symbolic manipulation in algebra is 2x + 3x = 5x.

[xiv] TIMSS is an international set of good tests on mathematics and science.

[xv] Also, the article, "School math books, nonsense, and the National Science Foundation" noted: "The ... radical de-emphasis of … arithmetic—the prerequisite to algebra—in NSF-funded and NSF-distributed math programs has stark consequences for science education, especially physics" in American Journal of Physics, also at http://www.csun.edu/~vcmth00m/nsf.html

[xvi] http://www.ams.org/notices/201106/rtx110600823p.pdf The AMS is the American Mathematics Society, a professional society for college professors of mathematics.

Attention to Number Sense as Well

Students need considerable practice in arithmetic calculations to develop **"**number sense." For the past quarter century, American textbooks have been minimizing arithmetic calculations. For this reason, students are not getting the necessary practice in arithmetic calculations to develop **"**number sense." As a mathematician (not a Math educator), **"**number sense" includes multiple representations of numbers, elegance in computation, mental calculation, estimation and assessment of reasonableness of results. PISA is aware of the importance of students developing these many aspects of "number sense." They are listed in PISA's description of its *quantity* category.

Involved arithmetic calculations and pre-Algebra calculations are *not* required by PISA. Grade 10 students can do well, even "score" 100% on a PISA test, but still become at-risk students in a rigorous high school physics course. When entering college, they may be on track for remedial Algebra I or even remedial arithmetic or become an at-risk biology major in college.

"The first section [of The PISA 2012 mathematics framework]—Definition of mathematical literacy—explains the theoretical underpinnings of the PISA mathematics assessment, including the formal definition of the mathematical literacy construct." The *crucial* sentence of PISA's formal definition of mathematical literacy is: *[Mathematical literacy] includes reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena.*

PISA's definition of mathematical literacy does not say: using mathematical concepts, procedures, facts and tools to do mathematical calculations (or do arithmetic and algebraic calculations).

The *quantity* category is the category of PISA's math that most uses calculations. PISA's description of the *quantity* category ends with: "Aspects of quantitative reasoning—such as number sense, multiple representations of numbers, elegance in computation, mental calculation, estimation and assessment of reasonableness of results—are the essence of mathematical literacy relative to quantity." The only *direct* mention of calculation is elegance in computation and mental calculation.

Involved arithmetic calculations are *not* required. As PISA notes: "Many PISA items that involve computations do not actually require a calculator, as the chosen numbers are amenable to mental arithmetic, or the rubric may allow an approach that involves rounding to convenient numbers."[xvii]

PISA accepts arithmetic formulas (expressions) for final answers; examples: $12\sqrt{7.25}$ and 60 + 30 received full credit for Question 2 for Garage and Question 2 for Sauce.[xviii] Also PISA accepts approximate numbers for final answers; example: A solution "from 8 to 9 years" provided with adequate (mathematical) calculations receives full credit for Question 4, Sailing Ships. So it is unclear how low the level of arithmetic calculations really is for non-multiple choice questions.

[xvii] Page 87 http://www.oecd.org/pisa/keyfindings/PISA2012_US%20report_ebook%28eng%29.pdf

[xviii] Pages 16 and 32 http://www.oecd.org/pisa/pisaproducts/pisa2012-2006-rel-items-maths-ENG.pdf

PISA considers it a burden for students to have to calculate an answer without the hints provided by multiple-choices. "One factor in this difficulty [in solving the 'Climbing Mount Fuji' problem] is that it is a constructed response item, rather than selected response, so students are given no guidance regarding possible answers …" [xix]

And as PISA notes for a particular question: Alternately, given that this item is multiple-choice, students might work backwards [from] each of the response options to calculate [a number] which provides the most reasonable result. [xx]

There are some arithmetic calculations but almost no algebraic calculations in the questions showcased. Exponents only appear in the Pythagorean theorem; only very simple uses of fractions appear.[xxi]

The only Algebra equation to solve in the 21 questions showcased in the PISA 2012 Released Mathematics Items report was the linear equation: 50 = 25 v / 60 x 3. Nothing as hard as Find R from the formula U = E – IR. [Answer: R = (E–U)/] [xxii]

The PISA exam omitted all math calculations and word problems on a test on Singapore math for Grade 7. On line, I read: "This test covers material taught in [Singapore Grade 7] New Elementary Mathematics 1." [xxiii]

The bulk of these Singapore Grade 7 questions are considerably more mathematically sophisticated than any of the questions in "PISA 2012 Released Mathematics Items."

PISA Difficulty Levels Inaccurate

Let us return to the Level 5 "Climbing Mount Fuji" question already discussed. According to the PISA frameworks manual, **"**At Level 5 students can develop and work with models for complex situations, identifying constraints and specifying assumptions. They can select, compare, and evaluate appropriate problem-solving strategies for dealing with complex problems related to these models. Students at this level can work strategically using broad, well-developed thinking and reasoning skills, appropriate linked representations, symbolic and formal characterizations, and insight pertaining to these situations. They can reflect on their actions and formulate and communicate their interpretations and reasoning." [xxiv]

[xix] Page 49 http://www.oecd.org/pisa/pisaproducts/PISA%202012%20framework%20e-book_final.pdf

[xx] Page 35 http://www.oecd.org/pisa/pisaproducts/PISA%202012%20framework%20e-book_final.pdf

[xxi] This includes the decimal division 9/1.5 in a difficult Level 5 item and 7 divided by ¼ in a difficult Level 6 item. PISA states: "although division by the decimal 1.5 km per hour may be challenging" it is nothing as difficult as adding ½ + ¼. Fractions only arise to recognize that 10/4 = 5/2 in the 4 questions for Levels 1-4 showcased.

[xxii] http://www.singaporemath.com/v/vspfiles/assets/images/pl_nem1test.pdf

[xxiii] http://www.singaporemath.com/v/vspfiles/assets/images/pl_nem1test.pdf

[xxiv] Page 49 http://www.oecd.org/pisa/pisaproducts/PISA%202012%20framework%20e-book_final.pdf

Yet the sample item description is merely "Calculate the start time for a trip given two different speeds, a total distance to travel and a finish time."[xxv]

PISA authors note that, "The communication demand is low. … The mathematisation required [involves aspects of] understanding how meal times are already included [from the sentence 'These speeds take into account meal breaks and rest times.'] and even that the trail will first be up and thenseparately down.

The representation demand is minimal with only the interpretation of text required … all the calculations are relatively simple." [xxvi]

PISA saying "the communication demand is low" was generous; the total communication demand was only to write the answer 11; no explanation required; no need to show work. Many of the Level 5 attributes do not even apply to "Climbing Mount Fuji," the only showcased Level 5 question.

PISA Question (LEVEL 6): Helen the Cyclist

Helen rode her bike from home to the river, which is 4 km away. It took her 9 minutes. She rode home using a shorter route of 3 km. This only took her 6 minutes. What was Helen's average speed, in km/h, for the trip to the river and back?

Average speed for the trip: ..... km/h

One method of solution could be:
Average speed = {Total distance} / {Total time}
Total time = 15 min. = ¼ hour
Average speed = {Total distance} / {Total time} = (4+3)/(1/4) = 28 km/h.

An alternate solution is: Helen rode 7 km in ¼ hour.
At this rate, Helen would ride 4 x 7 = 28 km in 1 hour or 28 km/h.

According to the PISA framework, "At Level 6 students can conceptualise, generalise, and utilise information based on their investigations and modeling of complex problem situations. They can link different information sources and representations and flexibly translate among them.

Students at this level are capable of advanced mathematical thinking and reasoning. These students can apply this insight and understandings along with a mastery of symbolic and formal mathematical operations and relationships to develop new approaches and strategies for attacking novel situations.

[xxv] Page 20 of PISA 2012 Released Mathematics Items http://www.oecd.org/pisa/pisaproducts/pisa2012-2006-rel-items-maths-ENG.pdf

[xxvi] Page 49 http://www.oecd.org/pisa/pisaproducts/PISA%202012%20framework%20e-book_final.pdf

Student at this level can formulate and precisely communicate their actions and reflections regarding their findings, interpretations, arguments, and the appropriateness of these to the original situations." [xxvii]

Unfortunately, none of the Level 6 attributes apply to the "Helen the Cyclist" question, the only showcased Level 6 question.

Is PISA valid?

This question is rarely asked. The data suggest it is not a valid measure of overall mathematical ability or the quality of an education at the national level. According to PISA, one in four of the PISA math questions are covered in the Common Core Math Standards for Grade 4 (or lower). More than half (56%) of PISA's questions are covered in the Common Core Math Standards for Grade 6 (or lower). Barely one in four PISA's questions are covered in the Common Core Math Standards for Grade 8 or 9. None are covered at the higher grades. [xxviii]

There is *little* significance to PISA showing that Grade 10 students of Country A do better on a Grade 6 math test than Grade 10 students of Country B. It *certainly* does *not* mean that Grade 10 students of Country A would do better on a Grade 10 math test than students of Country B.

All the 2003 math problems showcased on PISA's website belong in Grades 5 and 6, not Grade 9. This is also true for the five 2003 PISA problems on the BBC website, http://news.bbc.co.uk/2/shared/spl/hi/pop_ups/04/education_pisa_maths_questions/html/1.stm.

There is no high school math in any of the problems. But, PISA's math exam is taken by 15 year old students. For this reason, the PISA results are quite misleading

Involved arithmetic calculations and pre-Algebra calculations are *not* required by PISA. No serious evaluation of real (not PISA) mathematics literacy for 15 year olds can omit involved arithmetic calculations and pre-Algebra calculations.

As George Malaty, a professor at University of Joensuu, Finland, noted "PISA tests are measuring mathematics literacy. PISA test items are measuring the achievements of everyday life mathematics, including problems [but] no need to learn mathematics as a structure. We do know in Finland that we wouldn't get any success in PISA, if the test items were related to the understanding of mathematical concepts or relations." [xxix]

[xxvii] Starting at this page, http://www.oecd.org/pisa/test/form, OECD lets you try 6 questions, rated from Level 1 to Level 6. (You have to view them in order.) After trying or choosing a random answer, OECD provides its usually pretentious and misleading description of the level and category of the problem.

[xxviii] Solution: Isolate the unknown R. Adding –E to both sides yields: U – E = –IR Dividing both sides by –I yields: (E–U)/I = R

[xxix] "PISA Results and School Mathematics in Finland: strengths, weaknesses and future" http://math.unipa.it/~grim/21_project/21_charlotte_MalatyPaperEdit.pdf

Finland Beware—NOT Beware of Finland

Finnish engineering students have difficulty with fractions and simple algebraic expressions. Finland had often scored number 1 on the PISA Math exam. The U.S. has scored much lower.

This has misled U.S. education policy wonks to suggest that our math instruction is inferior to that provided to Finnish students and hence we should copy some aspects of Finland's education system.

Not so fast. The article, "Long Term Effects in Learning Mathematics in Finland—Curriculum Changes and Calculators" [xxx] notes that barely half the students who passed the advanced college matriculation examination in mathematics could calculate: (1/3 - 1/7)/4, [Answer: (4/21)/4 = 1/21] and only two of three could: Find R from the formula U = E – IR. (Answer: R = (E–U)/I)

This article (Page 53) notes that the number of Grade 9 Finns [the age group in the PISA survey] who could calculate the product: (1/6) x (1/2) [which is 1/12] dropped in half from 56% in 1981 to 28% in 2003. (Barely half of Grade 9 students being able to multiply fractions was NOT something to brag about in 1981.)

The article, "The PISA survey tells only a partial truth of Finnish children's mathematical skills," notes: [xxxi]

> "In order not to fail an unreasonably large amount of students in the [university's] matriculation exams, recently the board has been forced to lower the cut-off point alarmingly. Some years, 6 points out of 60 have been enough for passing.**"** Signed by 207 mathematics teachers in Finnish universities and polytechnics (universities of applied sciences).

The article, "Severe shortcomings in Finnish mathematics skills" notes: One example of poor knowledge of mathematics is the fact that only 35 percent of the 2400 tested students [at Turku Polytechnic] have been able to do an elementary problem where a fraction is subtracted from another fraction and the difference is divided by an integer [like (1/3 - 1/7)/4, above]. [xxxii]

[xxx] http://elib.mi.sanu.ac.rs/files/journals/tm/23/tm1221.pdf

[xxxi] Published in Helsingin Sanomat in February 17, 2005 Page 9
http://www.matilde.mathematics.dk/arkiv/M29/M29tema.pdf

[xxxii] Published in Helsingin Sanomat in March 10, 2005 (Page 10)
http://www.matilde.mathematics.dk/arkiv/M29/M29tema.pdf

If one does not know how to handle fractions, one is not able to know Algebra, which uses the same mathematical rules. Algebra is a very important field of mathematics in engineering studies. It was not properly tested in the PISA study. Finnish basic school pupils have not done well in many comparative tests in Algebra (IEA 1981, Kassel 1994-96, TIMSS 1999). The polytechnic teachers of professional subjects are astonished at how poorly students can handle algebraic expressions and solve equations. The decreased mathematical skills of the students have forced to reduce the teaching material in those engineering courses that most heavily rely on mathematics.

This is a serious matter taking into account the importance of engineering knowledge to the Finnish economy and welfare.

Author Biography

Jerome Dancis is Associate Professor Emeritus of Mathematics at the University of Maryland, College Park, MD. He has written articles on education policy as well as reports on pedagogy for Mathematics. Math education website: www.math.umd.edu\~jnd. E-mail: jdancis@math.umd.edu

Commentary

Why Schools In America Should Not Be Like Schools In Singapore

Barbara S. S. Hong, PhD
Associate Professor of Special Education
Senior Fulbright Scholar
Division of Education, Human Development & Social Sciences
Penn State University, Altoona College
Altoona, PA

Abstract

America is not Singapore and Singapore cannot be America. So why are we often comparing ourselves to high-performing countries based on international exams? Despite the educational crisis many U.S. schools are facing, Americans should be cautious not to mimic another country's model within our diverse classrooms. We are largely grounded on the values of individuality, inclusiveness, and ingenuity, something rarely shared by other countries. This article aims to dispel major stereotypes about Singaporean students and teachers in terms of special education, parental involvement, and academic tracking. We present a more careful and balanced picture of what schooling is like in Singapore and many Asian countries. Our goal is to challenge Americans to look beyond the ideology of a "panacea model" of education and ask ourselves if we really want to pay the price of admission to be ranked amongst these high-performing countries. We may not be at the top, but we are certainly not less.

Key Words

Singapore education, PISA results, international testing

It is seductive to entertain the idea that all our school problems would be solved if only every state, every classroom, and every student would come together and consent to a "panacea model" of education like one of the high-performing Asian countries. Some American educators and bureaucrats cite international test results as reasons to mimic aspects of Asian educational systems like those in Singapore, Japan, Shanghai, Hong Kong, or South Korea. In this article I share some information about the Singapore education system, from the point of view of a former citizen, and argue that all that glitters might not be gold.

Don't Believe the Hype

The Internet is saturated with stereotypical attributes of Asian students as hardworking, respectful, self-disciplined, candidly obedient, reflectively quiet, and remarkably filial (Bond, 1992; Yeung, 2013). But be cautious, because not everything you read online or hear from an education bureaucrat is comprehensive and reliable information (Elliott, 2002). Do not let snapshot descriptions or headlines mislead you into believing that the Asian personas portrayed in the mainstream media translate into propitious, stimulating, creative, carefree, and happy human beings (Diener, Helliwell, & Kahneman, 2010). This is especially true for Singapore.

The results from the first World Happiness Report (Helliwell, et al., 2012) painted a different picture of Singaporean culture than the one portrayed in the American media. People in over 150 countries were surveyed based on six variables: (a) real GDP per capita, (b) healthy life expectancy, (c) having someone to count on, (d) perceived freedom to make life choices, (e) freedom from corruption, and (f) generosity. Findings revealed that people in Singapore are some of the least happy on planet, even less so than people in Iraq, Haiti, Afghanistan, and Syria (Hoegberg, 2012).

It is gullible to correlate student results from international tests with enjoyment in school or learning in general. Research on the Trends in International Mathematics and Science Study (TIMMS) found that there is a statistically significant negative correlation between scoring high on international exams and the extent to which students actually enjoyed the subjects (reading, science, and mathematics) and feel confident about their own intellectual abilities (Helliwell, Layard, & Sachs, 2012). Also, according to the Association for the Evaluation of Educational Achievement (IEA) (2012),

Singaporean and students from other Asian countries might have attained top ranks in mathematics and science, but they scored lowest in "enjoyment" of these subjects. For example, Korea has traditionally placed in the top tier on international tests, but when it comes to learning attitudes and confidence, they scored lower than the international average (Seong, 2012). This outcome is the same for Hong Kong, Japan, Taiwan, and not surprisingly, Singapore. It is no wonder that so many Singaporean students, after graduating from high school, do not wish to pursue mathematics and science.

Price of Ranking

Do the means justify the ends for high rankings on international tests in Singapore? Teachers are permitted to, and routinely rebuke students in front of their classes for poor academic performance (Toh, 2012; Yeong, 2009). According to the American Psychiatric Association, such prevalent "academic" bullying could have resulted in the rise of Singaporean students suffering from somatoform disorder–a mental disorder

characterized by physical illness that cannot be explained by a medical condition (DSM-IV, 2000).

Instead of asking what is the secret to Singaporean's educational success, Americans should be asking, what type of outcome have these harshly unforgiving educational systems created, and if that is what we want for our children? A popular Asian saying goes like this: "Sleep four hours and pass, sleep five hours and fail."

Paradoxically, while some parents in Singapore are concerned about the high pressure their children are undergoing, they equally contribute to this madness by hiring private tutors for their kids, buying assortments of past year exam booklets to practice at home, and sending their kids to expensive after-school tutoring (average spending on tuition per month is about $4,000 per child; $160 per hour and $40 more after midnight hours). Kids even have to take an entrance exam to qualify for admission into the top tuition centers (Koh, 2012a).

What if their child is too tired of all these studying? Well, parents would turn to hiring more tutors to help complete their child's schoolwork as well as private tuition homework (Koh, 2012b). The children are expected to do all these extra assignments, regardless of weekdays, weekends, public holidays, or summer break. It is no wonder private tuition is a thriving industry in Singapore!

Cramming Their Way to Top

Singapore and many other Asian countries like South Korea, Taiwan, Hong Kong, China, India, and Japan established what are called cram schools where children typically study for four to six hours *after* their school day is over, and work on extra homework (Lawrence, 2002). Children often do not get home until past 10:00 p.m. and do not get to bed until almost midnight.

The mindset is that parents hope to give their children a boost by preparing them to get ahead of their teachers, not the other way around. Teachers are no different. They routinely call students back on Saturdays or stay after school for extra classes, especially during heavy exam periods. In brief, children's daily hours are largely occupied by exams and test preparation. It is a cycle of taking in information and reproducing that same information on a test.

Research shows that this narrow form of learning cannot lead to proactive critical thinking or effective problem-solving skills (Willingham, 2010). This type of imitation learning does not teach one *how* to learn, just *what* to learn. Although students graduate from high school and move on to universities, they struggle with *how* to think and how to have an opinion of their own. The prize of a good report card or high rankings on international tests comes at a very heavy price on creativity and leadership. Does America really want to pay such a price? Is PISA and TIMSS or any other international report card a valid barometer of academic success?

America is Not Singapore

Singapore is a country often held up as an example of a comprehensive education system. But should we be looking to Singapore? Keep in mind that Singapore, a previous British colony, is just a small (276 sq. mi) and over-crowded city, about the size Los Angeles and Philadelphia combined, (5.4 million people) situated on the tip of the Malay Peninsula. But, within fifty years, it has transformed into one of Asia's great economic success stories. Singapore is known for many things such as its paradisiacal shopping, culinary prowess,

cleanliness, diverse culture, astute politicians, stable economy, compulsory military service, cosmopolitan society, world-class airline, iconic infrastructures, and of course, education.

As of 2012, Singapore's Ministry of Education reported that it has 357 schools (1st grade-13th grade) with a total of 487,342 students. Compare that to America's 50.1 million students (U.S. Department of Education, 2013) and over 98,800 public schools (U.S. Department of Education, 2010) and 14,000 school districts. How ludicrous is it that U.S. bureaucrats would even contemplate comparing America to Singapore or any other small Asian system or city?

The Singaporean government's educational pursuit was originally shaped by its early political need to be a self-reliant and independent nation. What better way to promote this vision than to ensure that its people are educated? The Singapore Ministry of Education oversees the development of the national curriculum and has a great deal of control over how the curriculum is implemented and taught in every school (Gopinathan, 1997).

Tracked Out

From 1979 to 1996, Singapore concentrated on furthering the skills of individuals by instituting the practice of streaming (tracking) students within schools based on their academic abilities from elementary grades onward. Singaporean students receive six years of primary-school education before taking the PSLE (Primary School Leaving Certificate) that determines whether their secondary education will be in a top school for talented students, a mainstream school, a vocational school, or a special education setting. In 2005 the government created three set tracks for students in elementary schools: (a) Express, (b) Normal-Academic, and (c) Normal-Technical. In Singapore, a child's destiny is decided for him at the end of elementary school.

In many Asian countries, including Singapore, the future is bleak for students with special needs. Using Singapore as an example again, special education and inclusion are not always a priority. Children with special needs attend separate schools or special facilities run by the Voluntary Welfare Organization (VWO)–not a government unit. Despite the increasing number of children with special needs or those who are academically at-risk, Singapore has yet to formalize any disability legislation that will significantly impact the outcome of these children.

There is a theory that the government claims that special education children are "well taken care of" because it is a moral obligation of any good society to do so. But, a strong suspicion surrounds this theory because at-risk children are quietly placed in "other" facilities, not considered under the jurisdiction of government public schools. Accordingly, if they were not part of the public school system, then at-risk students would not be selected to participate in the PISA or TIMSS exams. That means those students who are selected to take these exams were already sorted to be above average academically, leaving a predictable result every time.

Moreover, a special education teacher in Singapore does not need to be formally trained or have had to earn a bachelor degree before they work with children with special needs. The Singapore teacher training institute (National Institute of Education) does offer a one year diploma program for teachers who are already working in special schools but they have to be nominated by their principals before applying.

Likewise, no general education teachers or school administrators need to be trained in special education interventions or pedagogies. More recently, the Ministry of Education mandated a model of professional development known as Training in Special Needs (TSN) for all public schools. However, this policy only asks for 10% of teachers to be trained, that is, four to five teachers per school ("School Aid for Disabled Kids," 2004).

Compare what you know about Singapore's educational system to America's system. In America, all students, whether they are refugees, migrants, legal (or illegal), English language learners, minorities, or have the most severe disabilities have equal access to public education from early childhood through high school. Why would we compare ourselves to a system that decides students' futures in elementary school and does not educate its students with special needs.

Chronic Fever

In November 2013, the Singaporean government adopted a new practice to combat the stress and results-conscious students, parents, and teachers. For the first time, the highest and lowest scores of the PSLE (6^{th} grade national exam) are *not* published, not even in the newspaper or on the students' report cards.

The hope is to nurture children from a young age to learn how learn rather than to compete for a test ranking. Regardless of the new policy improvements, parents in Singapore still praise their children based on the grades they receive rather than on the growth and development they have made as human beings. In essence, a culture of social-Darwinian selection and competition has been socialized into the culture of the country.

Singaporean parents fiercely defend the theory of competition and maintain that it is only through aggressive sorting that the society can separate the more able children from those with less academic prowess. Regrettably, instead of raising a crop of remarkable, confident, and highly skilled professionals to lead the country, Singapore merely churns out paper-pencil testing elitists, over-pressured kids, over-stressed teachers, and over-anxious parents.

America Is Model

We must not let PISA or TIMSS define the American education system or its values. Be proud that we *did not* make the top rank but yet managed to achieve so much collectively and individually because we are Americans. Being different does not mean we are behind. Don't dismiss failure or write off a child just because he/she does not seem like the studious type who will produce a predictable report card.

Being unpredictable has been one of our greatest strengths. Look at the long list of Americans who "failed" in school one way or another, yet succeeded in life above and beyond measures.

Unlike in many Asian school systems, there are ample opportunities for everyone in the United States, whether you love computers, making people laugh, directing movies, designing clothes, singing, dancing, drawing, and so forth. If anything, we should commend Americans for trying to be different every day and not imitating another country's culture. More people wish to be an American but fewer ever claim he/she wants to be a Singaporean, Chinese, Japanese, or Korean.

Singapore will always be a competitive society and so will many of the top-ranking

Asian countries. But, this does not mean that their thinking and learning are cutting-edge. On the contrary, rote memorization is considered the dark age of learning in education sociology. Perhaps Singapore should learn something from America when it comes to the social and emotional well-being of its people, especially the children.

What Matters Most

What the Singapore model of school offers is an ideology, not necessarily a future we want for our next generation. Let's not get carried away and plunge ourselves deeper into something we already knew we did not want to happen to this democratic nation of inclusivity and diversity. America should be careful in "borrowing" policies or practices from another nation. Singapore cannot be Finland, and Finland cannot be Singapore, and neither of them can be Canada. The verdict is the human race should not be a race at all. It should be about humanity, charity, empathy, and decency—qualities that every school should strive to inculcate in every child.

Author Biography

Barbara Hong was born and raised in Singapore and lived there for over 23 years before she arrived in the U.S.; She attend undergraduate in Hawaii and then went on to graduate school at Teachers College, Columbia University where she obtained three Masters degrees and a PhD in special education. She is a Senior Fulbright Scholar, a Senior Fulbright Specialist and a proponent of quality teacher education, transformational leadership, and empowerment of students in taking charge of their own learning. E-mail: bsh15@psu.edu.

References

American Psychiatric Association. Task Force on DSM-IV. (2000). Diagnostic and statistical manual of mental disorders: DSM-IV-TR. *American Psychiatric*, p. 485.

Bond, M. H. (1992). *Beyond the Chinese face: Insights from Psychology*. Oxford: Oxford University Press. Retrieved from http://www.ipedr.com/vol62/008-ICLMC2013-M10004.pdf

Diener, E., Helliwell, J. F., & Kahneman, D. (Eds.). (2010). *International differences in well-being*. New York: Oxford University Press.

Elliott, M. (2002). Test scores don't say it all. *TIME*, April 15, *159*(14). Retrieved from http://www.time.com/time/asia/features/asian_education/

Gopinathan, S. (1997). Education and state development: Lessons for the United States? In W. K. Cummings & P. G. Altbach (Eds.), *The challenge of eastern Asian education: Implications for America* (pp. 249 - 264). Albany, NY: State University of New York Press.

Helliwell, J. F., Layard, R., & Sachs, J. (Eds.). (2012). *World happiness report*. New York: Earth Institute.

Hoegberg, A. (2012). Poll: Are Singaporeans happy? December 21. Retrieved from http://www.cnn.com/2012/12/21/world/asia/singapore-least-happy/

Koh, M. (2012a). Parents hire tutors to do kids' school and tuition assignments. *The New Paper*, March 6. Retrieved from http://news.asiaone.com/print/News/Latest%2BNews/Singapore/Story/A1Story20120304-331544.html

Koh, M. (2012b). Kids take test to qualify for top tuition centres. *The New Paper*, March 6. Retrieved from http://news.asiaone.com/News/Latest+News/Singapore/Story/A1Story20120304-331546.html

Lawrence, E. (2002). Cram school's kinda cool. *TIME*, April 15, *159*(14). Retrieved from http://www.time.com/time/asia/features/asian_education/

School aid for disabled kids (2004). *The Sunday Times*, September 19, 8.

Seong Tae-je (2012). Understanding Korean education based on international study. The Korea Herald, December 30th, 20:20. Retrieved from http://m.koreaherald.com/view.php?ud=20121230000101&ntn=0

Toh, K. (2012). Teachers cheered by call to be firm with pushy parents. *The Straits Time*. September 17. Retrieved from http://www.moe.gov.sg/media/news/2012/09/20120917-st-teachers-cheered-by-call-to-be-firm-with-pushy-parents.pdf

Willingham, D. T. (2010). *Why Don't Students Like School: A cognitive scientist answers questions about how the mind works and what it means for the classroom.* San Francisco: John Wiley & Sons.

Yeong, A. B. (2009). Teacher insults student's mum. *The New Paper*, August 13. Retrieved from http://news.asiaone.com/News/Education/Story/A1Story20090812-160665.html

Yeung, L. (2013, December 23). Asian students' superiority at maths due to Confucian focus on hard work. South China Morning Post. Retrieved from http://www.scmp.com/lifestyle/family-education/article/1386776/asian-students-superiority-maths-due-confucian-focus-hard

Book Review

Children Dying Inside: Education in South Korea

Written by J. M. Beach

Terese M. Boegly
Doctoral Student, Educational Leadership
Graduate School of Education
Arcadia University
Glenside, PA

Mass media markets have successfully propagandized the message that United States public schools are failing deplorably. The pervasive political mantra suggests that they must be deconstructed and redesigned to model more successful international educational systems in countries such as Finland, Korea and Singapore.

To demonstrate just how poorly American students are performing, over simplistic and broad brushed references are continually made that compare achievement results from international assessments such as the Program for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMMS).

Additionally, The National Common Core website (www.core standards.org) homepage displays a graph of 14 countries ranked from highest achieving to lowest achieving. South Korea is ranked #1 and the United States is ranked in the 14th position. The economic and socio-political pundits claim that the way to fix our failing educational system is to adopt various business models that would allow for open market competition to drive the success and failure of United States schools.

In J.M. Beach's book, *Children Dying Inside: Education in South Korea,* he provides an examination of South Korea's "high-stakes testing" educational system. He illuminates the impact of the privatization movement of tutoring academies which play a significant role in the achievement results on international standardized tests by South Korean students.

Beach shares his firsthand knowledge of the hagwons that operate after the regular school day to prepare South Korean students for national and international assessments.

These exams hold the key to college admission in South Korea's highly competitive secondary education market. Beach weaves a narrative that describes the tremendous

pressure Korean families and society as a whole, place on their children in an effort to achieve greater social status and increased wealth for the family. The cost of attaining increased social and financial status is placed squarely on the shoulders of South Korea's children.

Beach's analysis begins with a brief history of South Korea and how in recent decades has realized tremendous economic growth. Beach attributes this phenomenon in large part to Western investment, state-sponsored capitalism, as well as, a national obsession on academic achievement. These financial, social and educational factors have contributed to South Korea's educational "perfect storm."

South Korean citizens are paying handsomely for their education in the private sector and the cost has continued to increase significantly and rapidly in recent years. Beach provides statistical information to support the findings that South Korean parents are spending between 10-30% of their family income on their child's private education beyond the school day.

Moreover, South Korean families spend more money on private education than in most other countries; approximately 69% of the total price. The spending on private education in Korea has increased about 5 billion dollars in a 5 year span making South Korea's education system one of the most, if not *the* most, expensive system in the world.

Beach continues his investigation of private education in South Korea by sharing his first-hand knowledge of the Korean hagwon and the direct impact they have on the children.

He found that the hagwons deliver instruction seven days a week, with long hours of operation. Legally hagwons are permitted to remain open from 5am-10pm. However, during recent governmental raids on hagwons some were found to be operating later than 1:00 am; leaving students with as little as 5 hours to sleep before beginning the regular school day the next morning. There are significant psychological and physical implications to the children of South Korea as a result of this intense pressure to perform well academically.

This price is being paid by South Korea's children as a result of the long hours of tutoring dedicated to the rote-memorization of isolated facts and skills, as well as, developing English language proficiency.

The next section of the book describes in depth the business model, organizational structure and mission of the Korean English Preparatory Academy (KEPA hagwon) which was found in 1999 by an English language tutor. He precisely describes how this small private school became a publically-traded corporate giant in the education industry in South Korea.

Beach explains how KEPA has now introduced the globalization of their business in an effort to secure a greater share in the ESL market. Beach noted that recently KEPA has spun off a separate corporate entity, KEPA America, Inc. which is designed to export the hagwon model to the American continent.

The final sections of the book describe the instructional rituals and surveillance that occurs within the KEPA operated hagwons. These include the operation of a closed-circuit TV system, which is continually monitored by KEPA corporate managers, to ensure the consistent delivery of the KEPA curriculum.

This section of the book also portrays the student's passive resistance and acquired

coping mechanisms that are developed to help them endure the tremendous pressure and long hours required of them as South Korean students.

Beach concludes his book by asking the reader to focus on these issues through an ethical lens. He asks his reader to consider the following the question: Is the South Korean educational model just and fair? He recognizes that the ends of South Korean education look very attractive and quite seductive. The statistics are impressive and the socio-economic transformation could be characterized as nothing short of a miracle.

However, Beach indicates, that the results do not tell the story of hardship and discriminatory factors at play within South Korea's educational system. Beach argues persuasively that South Korea should NOT be seen as a "global educational exemplar" and that in contrast, its educational model should serve as warning to other countries.

I found this book to be an excellent read for anyone with an interest in broadening their understanding of the cultural, financial and political factors in South Korea which have created a privatized education market and the implication it is having on this nation's youth.

Moreover, this book is for educational leaders who are not willing to accept that American schools are failing at face value and are passionate about making informed decisions about how to improve them.

This book is for anyone who is concerned with the current political climate in the United States to privatize our public education system based solely upon standardized test scores that would allow free and competitive market forces to determine the future of our children's education.

Children Dying Inside: Education in South Korea is written by J. M. Beach. CreateSpace Independent Publishing Platform; 54 pages, $9.99.

Mission and Scope, Copyright, Privacy, Ethics, Upcoming Themes, Author Guidelines & Publication Timeline

The *AASA Journal of Scholarship and Practice* is a refereed, blind-reviewed, quarterly journal with a focus on research and evidence-based practice that advance the profession of education administration.

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Below are themes and areas of interest for the 2012-2014 publication cycles.

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4. Teacher Quality (e.g., hiring, assessment, evaluation, development, and compensation of teachers)
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11. School reform policies
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Submissions

Length of manuscripts should be as follows: Research and evidence-based practice articles between 2,800 and 4,800 words; commentaries between 1,600 and 3,800 words; book and media reviews between 400 and 800 words. Articles, commentaries, book and media reviews, citations and references are to follow the *Publication Manual of the American Psychological Association*, latest edition. Permission to use previously copyrighted materials is the responsibility of the author, not the *AASA Journal of Scholarship and Practice*.

Potential contributors should include in a cover sheet that contains (a) the title of the article, (b) contributor's name, (c) terminal degree, (d) academic rank, (e) department and affiliation (for inclusion on the title page and in the author note), (f) address, (g) telephone and fax numbers, and (h) e-mail

address. Authors must also provide a 120-word abstract that conforms to APA style and a 40-word biographical sketch. The contributor must indicate whether the submission is to be considered original research, evidence-based practice article, commentary, or book or media review. The type of submission must be indicated on the cover sheet in order to be considered. Articles are to be submitted to the editor by e-mail as an electronic attachment in Microsoft Word.

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- Full title of book
- Author
- City, state: publisher, year; page; price
- Name and affiliation of reviewer
- Contact information for reviewer: address, country, zip or postal code, e-mail address, telephone and fax
- Date of submission

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Spring	October 1	January 1	February 15	April 1
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Submit articles to the editor electronically:

Christopher H. Tienken, EdD, Editor
AASA Journal of Scholarship and Practice
christopher.tienken@shu.edu

To contact the editor by postal mail:

Dr. Christopher Tienken
Assistant Professor
College of Education and Human Services
Department of Education Leadership, Management, and Policy
Seton Hall University
Jubilee Hall Room 405
400 South Orange Avenue
South Orange, NJ 07079

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