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ORIGINAL RESEARCH

South Korea's successful education system: lessons and policy implications for Peru

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Abstract South Korea's quality education system rests on four pillars: (1) putting education at the center of a long-term development strategy, (2) getting the right people to become teachers, (3) developing these people into effective instructors, and (4) prioritizing information and communications technology in education. In contrast, education policies in Peru change from government to government, official evaluations of teacher education institutes do not exist, teachers do not receive regular training, and the use of technology in education is limited. Taking into account South Korea's successful experience, Peru could seek to improve its education system with initiatives to support a long-term education policy, which has to include a clear plan to improve the accreditation process of teacher education institutes, the current salaries of teachers, the training of teachers, and the use of technology in schools.

Keywords South Korea's education system · Peru's education system · Information and communications technology in education · Program for International Student Assessment (PISA)

Introduction

One of the most distinctive characteristics of the South Korean people is their fervor for education, a fervor that is probably not equaled in the world. This passion for learning, often called the "education syndrome," has deep roots in South Korea's traditional respect for knowledge and strong conviction in ongoing, lifelong human development. This focus on learning originates largely from the age-old Confucian belief that man can be made

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better through education and that only the most educated should govern the country and society (Kim-Renaud 2005, p. 5).

The South Korean government prioritizes the country's education system because it is also viewed as an efficient, essential mechanism for nurturing national strength. South Koreans have attained extraordinary progress in making education accessible to all citizens. However, what has overwhelmed education specialists around the world is the rather exceptional fact that the South Korean education system has been adapted to the needs of growth and structural variations in the economy (Kim-Renaud 2005, pp. 5–6).

South Korea has experienced enormous economic growth over the last 50 years and now is one of the largest economies in the world. During the period 1960–2012, its gross domestic product per capita (GDPPC) increased from $1,467 to $21,562 (World Bank 2014). The economic and societal development of the country has been a success story since the 1960s. In just a few decades, South Korea has transformed itself from an underdeveloped nation to an industrialized country exporting high-technology products (Domjahn 2013, p. 16). Much of this development has been attributed to improvements in the country's education system. Various South Korean and international scholars (Ellinger and Beckham 1997; Han 1994; Kim 2000) have credited the nation's economic success to an efficient education system that provides the quality workforce necessary for economic expansion. The South Korean government established a strong public school system and employed it as the principal instrument for the country's nation-building project. Schools developed a new set of principles, doctrines, and skills that support the political–economic structure of the society. Therefore, there has been little doubt that the education system played a significant role in the nation-building process of South Korea (Lim 2005, p. 17).

Although the state in South Korea does not allocate a large amount of money to education [only 5 % of gross national product (GDP)], South Korea's educational quality in terms of student learning outcomes is one of the highest in the world. South Korean students always perform in the top rankings among countries participating in international tests such as the Program for International Student Assessment (PISA; World Bank 2014). In fact, the scores achieved by South Korean students in the worldwide PISA study are well above the Organisation for Economic Cooperation and Development, OECD average (2012).

Peru is an upper-middle-income country with outstanding economic growth over the last decade. As a consequence of prudent macroeconomic policies and a favorable external environment, Peru has become one of the top-performing economies in Latin America. Peru has experienced robust economic growth in recent years, due to favorable external conditions and a sustained process of economic reforms. The average GDP growth rate between 2002 and 2008 was 6.7 %, about 2 % higher than the average for South American countries. In spite of the global recession, the country experienced positive growth (0.9 %) in 2009, at a time when South American economies shrank by 0.3 % on average. In 2012, GDP grew at a rate of 6.3 %. This strong economic performance enabled a continuous recovery of Peru's income per capita, which increased by more than 50 % during the last decade, after almost 30 years of stagnation (Central Reserve Bank of Peru 2012, p. 15).

Public spending on education represents 17.1 % of Peru's national budget. This proportion is higher than that of South Korea (16.2 %), which has one of the best-performing education systems in the world. Moreover, Peru's solid economic growth has been accompanied by a high level of education enrollment. In general, school enrollment in Peru has been superior to that of neighboring countries (World Bank 2014). However, every measure of quality has shown that there is a large gap between the impressive achievements in education enrollment and the poor learning outcomes of students (OECD 2012).

This study aims to determine the factors responsible for South Korea's successful experience in achieving a high-quality education system. The goal is to understand the practices of this country for the sake of improving the quality of education in Peru, and to offer relevant insights, lessons, and knowledge that can be shared with the rest of the international community, as well as to provide valuable lessons for developing economies.

This research addresses the following questions: what factors explain South Korea's education success? What can Peru learn from South Korea's successful education system? What are the implications for Peru's education policy? The rest of the paper is structured as follows: "Educational achievements of Peru and South Korea" section presents an overview of the educational achievements of Peru and South Korea. "Factors that have contributed to South Korea's education success" section analyses the factors that have contributed to South Korea's education success. "Conclusions and policy implications" section offers conclusions and policy implications.

Educational achievements of Peru and South Korea

There are huge and obvious gaps in educational performance between South Korea and Peru. A comparison of the two countries' overall performance in education in terms of the Knowledge Assessment Methodology (KAM) is reflected in Fig. 1 and Table 1. The KAM diagram (Fig. 1) shows the performance of South Korea with education as the pillar of the knowledge economy. Compared to Peru's performance, the indicators of South Korea are strong, with 19 out of 20 indicators at the highest level; among these are the adult literacy rate, gross secondary and tertiary enrollment rate, high level of Internet access in schools, and mathematics and science literacy.

Table 2 shows the evolution of educational indicators for Peru and South Korea from 2000 to 2012. In addition to including the latest available data, these years match the most recent measurements of student learning performance conducted by the OECD through the PISA. Thus, they represent two important benchmarks to evaluate the progress of education quality in both countries.

South Korea does not assign a significant amount of money to education. In 2012, the country's public spending on education represented only 4.9 % of GDP. This ratio was lower than the OECD average (5.8 %). For instance, some OECD countries, such as Norway and Finland, assigned higher fractions of GDP to their education sector (8.8 and 6.8 %, respectively). In the same year, the percentage of South Korea's education budget derived from the entire government budget was 16.2 % (OECD 2012). This percentage has not shown a significant change since 2000. In contrast, Peru's public spending on education, despite having experienced a reduction of four percentage points since 2000, in 2012 accounted for 17.1 % of the country's national budget, a higher rate than that of South Korea (World Bank 2014).

The salary of teachers is high in South Korea and increases over time. In 2000, the annual salary of primary school teachers was US$39,720. After 12 years, this number had increased to US$46,338, which is significantly higher than the OECD average (US$39,401). In Peru, between 2000 and 2012, the salary of primary teachers showed a small increase, rising from US$3,288 to US$5,112. Over the same period, South Korea and Peru both employed more teachers: the student–teacher ratio fell in primary schools (from 32:1 to 19:1, and from 28:1 to 19:1, respectively) and in secondary schools (from 21:1 to 16:1, and from 20:1 to 16:1, respectively). By 2012, the average class size in both countries was the smallest it had ever been (OECD 2012).

Table 1 Education indicators of Peru and South Korea: comparative analysis

Variables	South Korea (group: all)		Peru (group: all)	
	Actual	Normalized	Actual	Normalized
Adult literacy rate (% age 15 and above), 2007	97.9	6.71	89.59	3.77
Average years of schooling, 2010	11.85	9.61	9.02	5.2
Average years of schooling, female, 2010	11.31	8.98	8.64	4.8
Gross secondary enrollment rate, 2009	97.22	7.72	89.05	5.45
Gross tertiary enrollment rate, 2009	100.02	9.93	34.48	5.11
Life expectancy at birth, 2009	80	8.97	73	5.66
Internet access in schools (1–7), 2010	6	9.16	3.9	5.27
Public spending on education as % of GDP, 2009	4	4.59	3	2.39
Quality of science and math education (1–7), 2010	5.1	8.7	2.5	0.53
Quality of management schools (1–7), 2010	4.5	6.49	4.6	7.02
15-year-olds' math literacy (PISA), 2009	546	9.67	365	0.49
15-year-olds' science literacy (PISA), 2009	538	9.34	369	0.33
School enrollment, secondary, female (% gross), 2009	95.3	6.62	88.61	4.66
School enrollment, tertiary, female (% gross), 2009	81.52	8.16	35.54	4.04
No schooling, total, 2010	3.6	6.06	6.8	4.49
No schooling, female, 2010	6.1	5.35	9.5	4.41
Secondary school completion, total (% of pop 15+), 2010	37.8	7.87	28.7	5.98
Secondary school completion, female (% of pop 15+), 2010	36.1	7.87	23.9	4.8
Tertiary school completion, total (% of pop 15+), 2010	16.2	9.06	13.2	8.35
Tertiary school completion, female (% of pop 15+), 2010	20.4	9.53	16.3	8.82

Source World Bank. Knowledge Assessment Methodology (KAM; http://info.worldbank.org/etools/kam2/KAM_page1.asp). Accessed April 2014

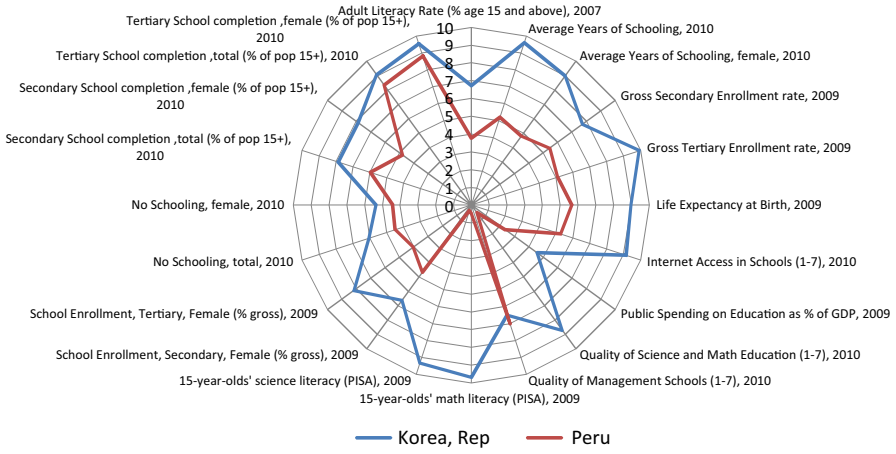

Fig. 1 Education indicators of Peru and South Korea in terms of the Knowledge Assessment Methodology (KAM). *Source* World Bank. Knowledge Assessment Methodology (KAM; http://info.worldbank.org/etools/kam2/KAM_page1.asp). Accessed April 2014

Table 2 Education indicators of Peru and South Korea (2000 and 2012)

Indicators	South Korea		Peru	
PISA assessment year:	2000	2012	2000	2012
Learning outcomes				
PISA: mean performance on the mathematics scale	547.0	553.8	292.0	368.1
PISA: mean performance on the reading scale	524.8	535.8	327.1	384.2
PISA: mean performance on the science scale	552.1	537.8	333.3	373.1
PISA: rank on the mathematics scale/among participant countries	3 of 41	5 of 65	41 of 41	65 of 65
PISA: rank on the reading scale/among participant countries	1 of 41	7 of 65	41 of 41	65 of 65
PISA: rank on the science scale/among participant countries	7 of 41	5 of 65	41 of 41	65 of 65
Financial investment in education				
Public spending on education, total (% of government expenditure)	16.6	16.2	21.1	17.1
Public spending on education, total (% of GDP)	3.7	4.9	3.4	2.8
Schools and teachers				
Pupil–teacher ratio. Primary	32.1	19.0	28.7	19.6
Pupil–teacher ratio. Secondary	21.0	16.2	20.4	16.5
Teachers' salary (annual, in US$, 2010 constant prices) at the primary level of education	39,720.0	46,338.0	3,288.0	5,112.0
Instruction time (for students, hours per year) at the primary level of education	737.0	703.0	720.0	720.0
Teachers' salary (annual, in US$, 2010 constant prices) at the secondary level of education	39,577.0	46,232.0	6,912.0	8,084.0
Instruction time (for students, hours per year) at the secondary level of education	867.0	859.0	1,080.0	1,080.0
School enrollment				
School enrollment, primary (% gross)	100.0	100.0	100.0	100.0
School enrollment, secondary (% gross)	98.9	96.7	84.8	90.7

Table 2 continued

Indicators	South Korea		Peru	
PISA assessment year:	2000	2012	2000	2012
Economic growth				
GDP growth (annual %)	8.5	2.0	3.0	6.3
GDP per capita (constant 2005 US$)	14,428.8	21,562.4	2,486.7	4,253.6
Economic development				
Human development index (HDI)	0.8	0.9	0.7	0.7

Source World Bank. World development indicators database (http://data.worldbank.org/data-catalog/world-development-indicators). Accessed February 2014

Organisation for Economic Cooperation and Development (OECD), "Education at a Glance 2012: OECD Indicators" (http://dx.doi.org/10.1787/eag-2012-en). Accessed February 2014

South Korea's primary and secondary school enrollment rates are almost 100 %. Peru has also achieved universal coverage of primary education, and enrollment in secondary education has reached 91 % (World Bank 2014). But do these results correlate with high learning outcomes of students? International assessments such as PISA now make it possible to frequently and straightforwardly compare and contrast the quality of educational results across education systems. The comparisons show wide variations in the extent to which countries succeed in developing knowledge and skills in key subject areas (mathematics, reading, and science).

As the results of PISA demonstrate, the poorest students tend to obtain lower learning outcomes. Figure 2 shows the relationship between the Gini index of income inequality and the average performance of students in the PISA assessment in each participant country. The Gini index is a measure for inequalities in the distribution of national wealth. It ranges from 0 (perfect equality) to 100 (total inequality). The mean performance of PISA participant countries has been averaged across the reading, mathematical, and scientific literacy domains. Overall, the relationship is negative: higher levels of income inequality are associated with lower levels of average performance. This relationship is fairly consistent, with the Gini index explaining 26 % of the variation in performance for the participating countries. Korea shows high student performance, with a Gini index of income inequality of 31.6. Another picture emerges when Peru is examined. It shows relatively low student performance, with one of the highest levels of income inequality among all participating countries, a Gini index of 46.2 (OECD and UNESCO 2003).

However, exceptions to the above findings do exist: by developing a detailed macro-level analysis of the PISA 2012 test, Luque (2014) found that the same education assessment reveals that some students and schools in Peru and South Korea exhibit high educational performance despite facing adverse conditions, especially poverty, and that some groups of students of similar socioeconomic conditions achieve markedly different results. On one hand, some schools with low-income students have achieved good results. For example, of the top-scoring quartile of Peruvian schools in PISA 2012, 12 % belong to the poorest segment of the country. For South Korea, this same percentage rises to 14 %. Additionally, 7 Peruvian students and 17 South Koreans, who come from socioeconomic backgrounds defined as poor in their respective countries, rank among the 100 best-performing students of PISA 2012. On the other hand, coming from an affluent socioeconomic background is not a sufficient condition for performing well in education assessments. Figure 3 uses PISA's socioeconomic conditions index to visualize disparities among countries. It is important to note that 2 represents the highest possible and −2 the lowest possible socioeconomic background on the index scale. In South Korea, the students from an index 1 socioeconomic level achieve, on average, a score of 600 in PISA's mathematics section. In Peru, for students of the same socioeconomic level, this score is 450. Similarly, the students from an index −2 level attain a score of 500 in South Korea, while they only earn 350 points in Peru. In other words, even when Peru's richest students are included, Peruvian students perform much more poorly than their South Korean peers. This observation leads us to conclude that the way in which the education systems of Peru and South Korea are organized could possibly explain the differences in learning for individuals from similar socioeconomic backgrounds. These differences in scores across these two countries between students from similar socioeconomic backgrounds demonstrate that while poverty can be a barrier to learning, this obstacle can be overcome. PISA helps us identify successful cases that can serve as examples for other countries. Numerous experiences from Latin America and elsewhere in the world exist demonstrate that poverty should cease to be a barrier to equal access to quality education.

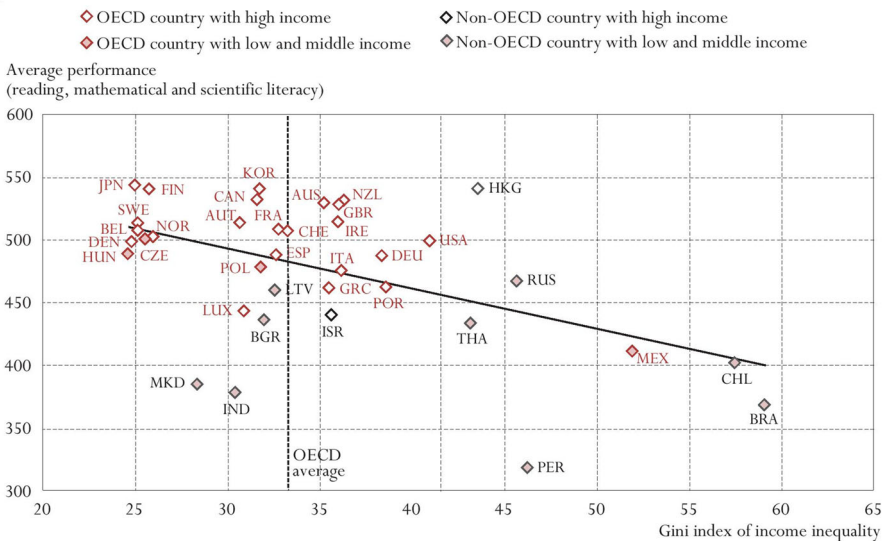

Fig. 2 Student performance and Gini index of income inequality. *Source* OECD and UNESCO (2003, p. 115). OECD PISA database, 2003. Tables 1.4 and 3.3

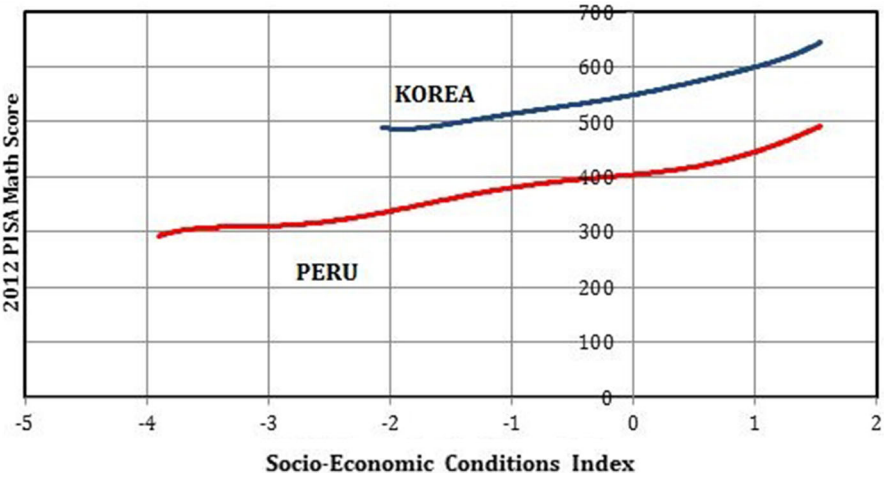

Fig. 3 2012 Mathematics PISA results by socioeconomic level: Peru versus South Korea. *Source* Luque (2014)

South Korean students consistently achieved high mathematics, science, and reading scores in the 2000 and 2012 PISA assessments. In 2000 South Korea ranked 7th for reading, 3rd for mathematics, and 1st for science, and in 2012, 5th, 5th, and 7th, respectively. However, this was not the case for Peru, which was the worst performer on both tests in all subjects. On PISA 2000, Peru ranked 41st (last) in reading, mathematics, and science, and on PISA 2012 it ranked 65th (last) in the three areas (OECD 2012). As noted, Peru does a relatively good job at increasing the rate of school enrollment, but the quality

of learning outcomes is poor. For Peru, the PISA results have been disappointing, showing that its students' performance lags considerably behind that of other countries.

South Korean children work very hard and spend more time on their studies than perhaps any other students. The number of hours of compulsory instruction per year for primary school students is 703. That of secondary school students is 859 h per year (OECD 2012). What distinguishes South Koreans from everyone else, however, is the great number of hours they study outside the classroom. For example, high school students are often engaged in academic activities until midnight and later. After taking classes in up to 11 subjects, they attend private academies called "hagwons" (Ripley 2011). Private after-school instruction is principally aimed at preparing students for the college entrance examinations. While these private education courses cover a wide range of subjects, mathematics is the most common, and most secondary school students attend additional mathematics private institutions or receive tutoring outside school hours. This reflects South Korean students' emphasis on mathematics, and results in South Korean students having greater exposure to mathematics instruction and practice (Park 2004, p. 88).

In 2010, 74 % of South Korean students engaged in some kind of private tutoring, at an average cost of $2,600 per student, per year. Currently, there are more private instructors in South Korea than there are school teachers, and the most popular of these private tutors make millions of dollars a year from online and one-on-one classes (Ripley 2011). South Korean families assign a large portion of their budgets to complementary education. In 2007, families spent an average of 12 % of their income on supplementary education such as extracurricular test preparation (Hyo-sik 2008). However, this extreme emphasis on extracurricular education is not without costs. The private tutoring expenses burden the family budget and also hinder the sound development of students. It is also considered to be one of the causes of the public education crisis by deepening parental distrust towards school education in favor of private tutoring (Kim and Han 2002, p. 13).

On the other hand, the number of compulsory hours of instruction per year in Peru is higher than in South Korea. Theoretically, primary school students have to attend 720 h, and secondary school students must attend 1,080 h. However, in practice, teacher and student absenteeism, teacher strikes, special national holidays, student parades, and other nonacademic activities mean that the total compulsory class hours are not met. It is estimated that the actual amount of instruction time students receive is between 80 and 50 % of the mandatory time. In rural border areas, where schools have only one teacher and multigrade classrooms, it was found that the ratio is not even 30 %. Research conducted by the Ministry of Education (MOE) on rural schools found that on average in the 16 schools examined, students had received only 60 % of the classes that they should have received. The same study stated that the Andean region is the area with the lowest percentage of real class time (International Bureau of Education, IBE and United Nations Educational Scientific and Cultural Organization, UNESCO 2011).

One of the most distinctive and admirable characteristics of South Korean society is its cultural and social emphasis on education. For this reason, school children are encouraged to spend the majority of their day studying. This obviously has a positive impact on South Korean students' learning outcomes. Test results are evidently affected by students' attitudes towards the test, and this is also applicable to international comparative studies. In many Western countries, for students to take the PISA test, public schools had to obtain approval from the students' parents. The test was not mandatory. This may have conveyed a wrong message to students that this was an activity that did not count, and, consequently, students may have tended not to take the test in a serious manner. On the other hand, South Korean students raised in the Confucian culture are educated to regard testing very

seriously. This general and serious attitude towards testing may have influenced their performance positively (Park 2004, pp. 88–89).

Based on the above results, it is more than clear that South Korea is at the top of the list of countries with the best education systems worldwide. Indeed, the Economist Intellectual Unit (EIU 2012) considers the South Korean education system the most effective and best organized in the world. Thus, in South Korea the correlation between student enrollment and quality outcomes is positive, whereas in Peru this correlation is negative. However, from this, another important question arises: what are the determining factors of South Korea's successful experience in achieving a high-quality education system?

Factors that have contributed to South Korea's education success

Research by Kim and Han (2002), Park (2004), García and Sandoval (2013), and Sami (2013) finds that South Korea's quality education system rests on four pillars: (1) putting education at the center of a long-term development strategy, (2) getting the right people to become teachers, (3) developing these people into effective instructors, and (4) prioritizing information and communications technology (ICT) in education.

Education is a primary driver of South Korea's long-term development strategy and a high priority for policy makers. There is strong alignment among South Korea's growth strategy, labor market needs, and education policies. Every 5 years, the Ministry of Education, Science, and Technology updates and improves the national curriculum, taking into account changes in the economic and national conditions (Severin and Capota 2011, p. 3). Conversely, a totally different approach is taken in Peru; here, education is often placed at the periphery of development strategies, and education policies lack continuity, changing from government to government (García and Sandoval 2013).

The available evidence suggests that the quality of a school system rests on the quality of its teachers. As stated by Emma Kim, the founder of Ewha Womans University, "The quality of an education system cannot exceed the quality of its teachers." She is explicit about the importance of getting good people into teaching (Sami 2013, p. 26). Different studies undertaken in the US suggest that the variations in the amount of student learning at school depend mainly on the quality of the teachers. Research using data from Tennessee reveals that when two average 8-year-old students were given different teachers—one, a high performer, the other a low performer—the performance of these students differed by more than 50 percentile points within 3 years. Another study conducted in Dallas shows that the performance gap between students assigned three effective teachers consecutively and those assigned three ineffective teachers one after another was 49 percentile points. In Boston, students placed with top-performing mathematics teachers made significant gains, while students placed with the worst teachers went backwards—their mathematics knowledge and skills worsened (Barber and Mourshed 2007, pp. 12–13).

Only graduates in the top 5 % of their class at South Korean teacher education colleges can become teachers. This makes the teaching career prestigious and secures consistency in teacher quality (Severin and Capota 2011, p. 3). In South Korea, finishing the 4-year instruction at a college of education does not in itself qualify the graduated students to teach in public educational institutions. The graduates are awarded a teaching certificate granting them eligibility to teach only in private schools; to meet the requirements to teach in public schools, certificate holders are required to pass a very challenging national examination, the teachers employment test. This test guarantees that teachers (in the public sector at least) have a strong comprehension of the prerequisite knowledge before entering

the profession. In sum, the intense competition for preservice teacher education and the demanding entry test to be a teacher guarantee that teachers are selected from a group of candidates with high scholastic achievement whose training continually reflects the most current professional knowledge (Park 2004, pp. 90–91). It is more than obvious that teachers are the most important component that impacts the quality of education and determines its success or failure. Hence, the initiatives to attract excellent human talent to the teaching profession, and to develop and retain those teachers, are linearly associated with the improvement of educational quality. That is why the teacher attraction, training, and retention policy has never been left out of the education reform measures carried out by the successive political regimes of South Korea (Kim and Han 2002, p. 3).

In contrast, in Peru, the teaching profession carries a low status and the requirements to become a teacher are much less demanding; for example, to be admitted to a pedagogical institute or university to study education, candidates need a much lower admissions score compared to that of other professions. Furthermore, there is a variety of pedagogical institutes and universities, each with its own curriculum and requirements without official regulation. Thus, teachers enter the profession with varying academic credentials (Bedoya 2011). According to Law 29510, professionals from fields other than education can teach in public and private schools without being members of the Peruvian Professional Association of Teachers and without having taken courses in pedagogy. Although the objective of the government is to improve the quality of education through the incorporation of first-class professionals from different backgrounds, this policy is strongly objected to by the Peruvian Association of Teachers and by various teachers colleges in Peru. These education professional bodies point out that the professionals from different fields who teach in public or private educational institutions at various levels and modalities should earn a professional diploma and have to join the teachers association, since pedagogical knowledge and methodology are essential to teaching (González 2010).

The starting salaries of teachers relative to other occupations and the growth in earnings carry a lot of weight in a graduate's decision to become a teacher. Thus, an essential element for getting the right people to become teachers is to offer them a good starting remuneration. Most of the top-performing education systems in the world, such as South Korea, Singapore, Hong Kong, Finland, Germany, and The Netherlands, pay starting salaries that are at or beyond the OECD average (Fig. 4). The range of starting salaries offered by the above-mentioned countries is very narrow: the majority of systems pay a starting salary between 95 and 99 % of their GDPPC (among all OECD member countries, starting salaries range from 44 to 186 % of GDPPC). Amid this top group, what is remarkable, however, is the case of South Korea and Germany, where starting salaries for teachers are about 141 % of per capita GDP (Barber and Mourshed 2007, pp. 26–27).

Indeed, a teacher's salary is high in South Korea and rises over time, encouraging teachers to stay in the profession long term. For instance, the starting annual salary for a secondary teacher is US$27,476. After 15 years of teaching, South Korean teacher salaries increase to US$48,146, which is significantly higher than the OECD average (US$41,665). On the other hand, a secondary teacher's starting salary in Peru is among the lowest in the world. In the South American region, Peru has the second-lowest annual teacher salary (US$8,292), with only Bolivia paying its teachers less. In Chile, where teacher remuneration is higher than that of other Latin American countries, the starting salary is US$18,034, and after 15 years, teachers' earnings increase to US$25,027. In Peru, even after 20 years of teaching, a secondary teacher can only earn a maximum of US$20,732 (OECD 2012).

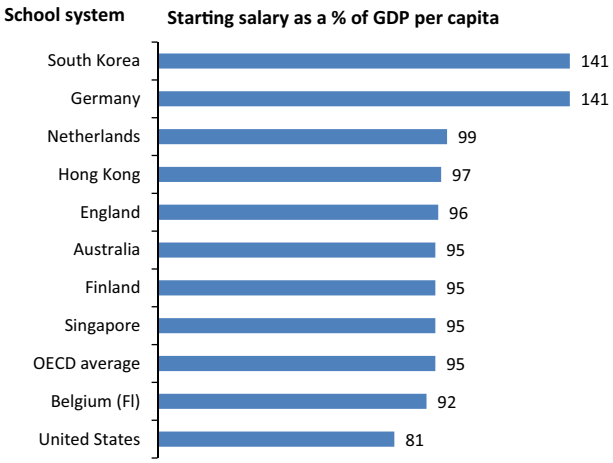

Fig. 4 Starting salaries in top school systems. *Source* OECD education at a glance 2005. Interviews, McKinsey Barber and Mourshed (2007, p. 28)

In South Korea, it is understood that the quality of education derives from the quality of teachers. This means that teachers have a responsibility to guide students on the right path. Therefore, enhancing the qualifications and capabilities of teachers has gained great popularity. The capabilities and qualifications of teachers are nurtured from the time they are enrolled and trained as student–teachers. This can improve their general abilities as a teacher. In this respect, South Korea has a favorable position compared to other countries. The qualifications of student–teachers who enroll in teacher training institutes are excellent. The student–teachers who join teacher training institutes score in the top 5 % on the college entrance examination. These top-quality students complete their 4 years of college and become the nation's teachers (Kim et al. 2012, pp. 6–7).

South Korea has executed various policy actions to foster first-rate teachers. To guarantee that teachers are well qualified, the process to attract really gifted student–teachers to teacher training institutes has been reinforced with control and teacher training activities. Every 5 years, the Korean Educational Development Institute evaluates teacher education institutes. The evaluation covers such areas as curriculum, teaching and learning, and finance and administration. The results of the evaluation are sent to the individual institutes and are open to the public, with the intention of improving quality. The effort echoes the South Korean government's idea that effective education is the impelling force of national progress and capable teachers are crucial for successful education (IBE and UNESCO 2011). In Peru, the National Educational Quality Evaluation, Accreditation, and Certification System (SINEACE) was created in 2006 to regulate the evaluation, accreditation, and certification process of teacher education quality. This organization has among its major goals to help higher education institutions manage their accreditation process and to provide access to information relevant to their continuous improvement in education quality. However, SINEACE has not yet completed the accreditation process of teacher education institutes. Even more worrying is the lack of knowledge among the teacher community and the Peruvian population in general about the existence of this organization and the important role it plays in the development of the education system in Peru (Saravia 2008).

In South Korea, school teachers have to take part in professional-development activities. The government mandates a minimum of 20 h of professional development for each

teacher every year. However, the majority of teachers attend between 40 and 60 h of professional-development activities to keep abreast of new developments in their areas of expertise. Korean teachers exchange ideas and support one another. More experienced teachers work jointly with and offer lesson plans and classroom activities to less experienced teachers every week. All materials, including worksheets and technology-based activities, are published each week on a special website and made available to all teachers. Teacher guide books are supplied in addition to the standard instructor textbooks for teachers. The guide books offer useful resources for teachers and include lesson plans, recommendations for group activities, and detailed specifications for teaching curriculum goals. Normally, teachers are rotated among schools every 5 years. In other words, they do not stay in the same school during their entire career. This helps to offer equal educational opportunities for both students and teachers, regardless of the socioeconomic status of the community where a school is located (Sami 2013, pp. 22–25). In Peru, the MOE through its Plan Maestro (Teacher Plan) offers short courses, refresher courses, and specializations for teachers in educational institutions in all regions of the country. The purpose is for teachers to have the opportunity to improve their professional performance and pedagogical methodology. These courses are offered face to face and online, but only a limited number of teachers set by the MOE can attend these courses. Between 2013 and 2014, the Plan Maestro aimed to instruct 368,572 teachers. This target group is smaller than the total number of teachers in Peru (435,882), excluding 67,310 teachers. In other words, not all Peruvian teachers receive training every year (Salinas 2013).

The importance given to education in Korean society is an effective way of achieving a workforce that is prepared for the twenty first century knowledge society. Education is part of South Korea's long-term vision of preparing its population for future labor markets and closing the gaps in access to quality education. For this reason, for decades, South Korea has included technology in education. E-learning platforms are employed to strengthen curricula, increase communication, and bridge gaps in access to quality education. To supervise the quality of e-learning programs, the government enacted the e-Learning Industries Development Law in January 2004. The Korea Education and Research Information Service (KERIS) has been controlling the Quality Certificate System for Educational Content since 1998. In 2006, KERIS designed a systematized version of the Quality Certificate System for Educational Content, the Quality Certificate System for e-Learning Content (Severin and Capota 2011, pp. 4–6).

Most recently, Korea became the first country in the world to replace print textbooks with electronic versions. These digital versions include the content of existing textbooks and incorporate digital media resources such as video clips, animation, and virtual reality. The Digital Textbook Promoting Plan was created to make high-quality digital textbooks suitable for the educational environment of the future and to support the goal of "Knowledge Korea" by developing the national database for teaching–learning and by exporting such information throughout the world (Severin and Capota 2011, p. 4).

Highly trained teachers are the keystone of South Korea's efficient incorporation of technology into education. Teachers can obtain credits for taking ICT classes in official ICT teacher training programs situated in each province. Most of these courses are offered online. In 2006, the Ministry of Education and Human Resources (MOE&HRD) and KERIS modified teacher training programs to incorporate technology in classrooms. This updated program has allowed teachers to use technology more effectively. Recent statistics reveal that 72 % of all Korean teachers use technology in the classroom (KERIS 2006).

Education is taken very seriously by Korean students and parents, and private institutions and tutoring courses, in addition to regular school classes, have become main

components of education in Korea. A survey conducted in 2003 by the Korean Institute of Educational Development (KEDI) reported that 72.6 % of Korean students (83.1 % of elementary, 75.3 % of junior high, and 56.4 % of senior high school students) are taking at least one private lesson in addition to regular school work (Park 2004, pp. 87–88). The large amount of family income invested in complementary education in South Korea has led to great inequality in access to supplementary education between high- and low-income students. In 2004, the government tried to deal with this problem by establishing the cyber home learning system to improve the quality of public education, decrease the amount of money spent on private tutoring, and close the education gap among regions and among social classes. The system provides students with complementary learning material to study at home via the Internet in order to ease the cost of private lessons and to eradicate the education gap in primary and secondary schools. The system is utilized by more than three million students, half of whom come from nonurban areas or lower-income zones (Severin and Capota 2011, p. 5).

The South Korean government has also launched platforms that categorize and administer education-related administrative data. Examples of these platforms include the national educational information system (NEIS) and the school information disclosure system (SIDS). The NEIS was developed to facilitate school administrative matters such as remuneration, staff information, school admissions, and academic affairs. The NEIS processes and saves for future use a variety of information generated by educational institutes and makes this information available to users with the aim of supporting prompt decision making when implementing educational policies, improving efficiency in educational management, assuring solidity in public education, and enhancing services to users. The SIDS contains information related to school regulations, student and teacher status, educational activities, school achievements, test results, and national standardized test results. This system ensures the right of students and parents to know this information, and, consequently, raises the attention and contribution of parents and the local community. This system is also helpful when students have to change schools; their information is saved in an online database and becomes available to whichever school they attend. The SIDS is heavily consulted, receiving roughly 20,000 visitors per day; 7.7 million people have accessed the site since its release in 2008 (Severin and Capota 2011, pp. 4–6).

The 2013–2014 World Economic Forum Global Competitiveness Report classifies Internet access in Peruvian schools as limited. This evaluation uses a scale of 1–7, where 1 means very limited and 7 means pervasive (meaning most children have frequent access). In each country surveyed, scores were calculated from a large sample group responding to the question of whether Internet access in schools in the country where they live was widespread. Peru earned a score of 3.7 and was ranked 94th among 148 countries. Conversely, South Korea is considered one of the countries with the highest Internet access in schools. It earned a score of 6.1 and was ranked 13th out of 148 countries.

From the above results, it is easy to infer that Peru needs to improve the level of access to technology in schools. One initiative undertaken in Peru to foster the use of technology in classrooms is the "One Laptop per Child" (OLPC) program. This program was developed by the Inter-American Development Bank in collaboration with the Peruvian government, and aims at improving education quality by providing one laptop to each primary school child in the poorest areas in the country. The OLPC program was launched in 2008 with the distribution of 40,000 laptops in about 500 schools. A study carried out in 2012 presents the results of the impact evaluation of the OLPC program in Peru, and reveals important lessons on how to implement programs that provide students with computers and what kinds of results can be expected from such programs. First, the

program has significantly narrowed the digital divide, enabling many students and teachers in remote areas to have access to laptops and educational content. Second, positive outcomes were found in cognitive skills tests designed to assess reasoning abilities, verbal fluency, and processing speed in children. The findings indicate that children who were given a laptop were 5 months ahead of the usual progression in the growth of these abilities compared to children who did not receive a laptop. However, no statistically significant differences were found between children in beneficiary schools and children in control schools on mathematics and language learning outcomes, or on school enrollment and attendance. These results are important, as these four factors have proved to be predictors of academic and work performance (Cristia et al. 2012, pp. 2–20).

Conclusions and policy implications

This paper is not meant to show how superior South Korean students are in their achievements in international tests when compared to Peruvian students. It is meant to be an initial analysis aimed at exploring a successful education system, and examining the key factors contributing to South Korea's positive outcomes. The value of this study lies in providing developing countries like Peru the opportunity to contrast their education policies with those implemented by a top-performing country. The goal is to allow Peruvian policy makers and civil society to identify the policies that have been successfully applied in South Korea, and to evaluate whether they could be adapted to the Peruvian education system context.

The available evidence suggests that South Korea's quality education system rests on four pillars: (1) putting education at the center of a long-term development strategy, (2) getting the right people to become teachers, (3) developing these people into effective instructors, and (4) prioritizing ICT in education.

South Korea's experience demonstrates that a high-quality education is an achievable goal, and that excellence can be attained by making education a primary component of a country's long-term development strategy. Peru has to make education a priority for its policy makers, and has to position this sector as a main driver of its growth strategy. In Peru there is no continuity in education policies. Each new government elaborates and establishes its own education policy. As a consequence, at the end of each governmental term, policies remain inconclusive. Thus, it is crucial for Peru to establish a long-term education development plan, since continuity is vital for a successful education system.

In South Korea, teachers are selected from a group of candidates with high academic achievement. Candidates have to meet demanding requirements and perform well on challenging tests to enter the teaching profession. The South Korean government holds that paying teachers a good salary is essential for getting the right people to become teachers, and for encouraging teachers to stay in the profession. Thus, in comparison to other top education systems, a teacher's salary in South Korea is among the highest in the world and increases over time. Likewise, teachers are continually trained to keep them abreast of new developments in their areas of expertise. In contrast, in Peru, the requirements to become a teacher are much less exigent, to the extent that professionals from fields other than education can teach in public and private schools without knowledge of pedagogy and teaching methodology. Evaluations of the quality of teacher education institutes have not yet been conducted, and there is no an evaluation plan stating criteria to assess the quality of those institutes. Not all teachers can benefit from the trainings offered by the MOE.

What is worse, the salaries of teachers in Peru are low compared to those of teachers in other parts of the world.

To foster first-rate teachers and guarantee that teachers are better qualified, Peru should greatly improve and support its SINEACE so that it can effectively perform its role of controlling the quality of teacher training institutes. SINEACE must develop a clear plan to complete the accreditation process of teacher education institutes, and make its results available to the public. Most importantly, Peru has to increase teacher salaries and make them at least comparable to those of other countries with a similar level of income. It is inconceivable that Peruvian teachers, who determine the quality of education and the success or failure of the education system, are receiving some of the lowest salaries in the world. Low salaries could be why mainly low-qualified students choose to become teachers. However, if more attractive salaries were offered, better qualified students would be motivated to become teachers. Thus, an essential element for getting the right people to become teachers is to offer good remuneration. Finally, it is essential that all Peruvian teachers receive ongoing training. This training could be organized by the state or by private education organizations such as NGOs or formal national education institutes.

For decades, South Korea has consistently included technology in education. E-learning platforms are employed to strengthen curricula, increase communication, and bridge gaps in access to quality education. The South Korean government has launched online platforms to categorize and administer education-related administrative data, improve the quality of public education, close the education gap among regions and among social classes, and decrease the amount spent on private tutoring. Teachers in South Korea receive ICT training to use technology more effectively in their classrooms.

In Peru, Internet access in schools is limited. Conversely, South Korea is considered one of the nations with the highest level of Internet access in schools. This information lets us easily conclude that Peru needs to improve the level of access to technology in its schools. Initiatives such as the "One Laptop per Child" (OLPC) program to foster the use of technology in classrooms must be extended to the whole country and not remain just a pilot program with a limited number of beneficiaries. The impact evaluation study of the OLPC program in Peru shows that it has significantly narrowed the digital divide, enabling many students and teachers in remote areas to have access to laptops and virtual educational information.

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