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Quality, inequality and recent education reform

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This paper presents the structure of the country's educational system in terms of its composition, financing, quality, and distribution. It provides a perspective on why the most recent education initiatives in the Philippines are misdirected. The present quality of education offered by the large majority of schools, both public and private, is shown to be poor by any standard. Of particular concern is the small number of universities that offer science and technology programs especially at the graduate level. Adding years of schooling and expanding the curriculum in basic education, the K-12 program, only further diverts resources from addressing the more fundamental quality issues plaguing the system. In higher education. Affording universal free tuition in state universities and colleges fails to address the real reasons for low college attendance among the poor. Such a move similarly draws resources and policy focus away from the more urgent need to promote higher education in science and technology. The paper instead suggests strategies for raising the quality of education and developing science and technology programs.

JEL classification: I21, I22, I23, I24
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1. Introduction

Poor quality and unequal access to good education have been the critical and perennial problems of Philippine education [HDN 2000]. Unfortunately, the education measures recently enacted by Congress—namely, the K-12 program and free tuition in state universities and colleges—are unlikely to mitigate them. The K-12 law, or Republic Act 10533, passed in 2011 extends high school education from four years to six years to match the 12-year international duration. The extension is thought to improve the quality of basic education. Republic Act

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10931, or the Universal Access to Quality Tertiary education Act, abolishes tuition fees in all state universities and colleges (SUCs). I contend that these programs will only worsen the already tight financing of public education and thus make it even more difficult for government to fulfill its proper role in education..

Both the K-12 and the free tuition programs perpetuate a long-standing expansionary education policy pursued by government over the past century. The K-12 program entails substantial financial costs for government and families alike with no guarantee of improvement in education quality. It is also unclear whether these measures will mitigate the existing inequality in access to education. The extra cost to families of a 50 percent increase in the duration of high school or college education is bound to discourage many from completing either. The additional budgetary support that the two programs entail could have been more efficiently allocated to improving the quality of both basic and higher education through the adoption of existing superior alternative curricula, modern instructional technologies, high quality textbooks and learning materials, and science laboratories. At best, the two programs are band-aid solutions to the problems of quality and equity; they appear instead to have been adopted from a political perspective and without careful consideration.

To provide a perspective on the long-standing problems that these latest initiatives fail to address, the next section reviews the structure of the country's educational system, emphasizing wide variations in cost and the resulting quality. The succeeding sections then provide more detailed discussions of the central aspects of public financing both in terms of size and allocation (Section 3), education quality (Section 4), and social access (Section 5). A final section concludes and ties together the argument.

2. Structure of the education system

Basic and higher education in the Philippines are delivered by both public and private institutions. In 2013-2014, there were 38,648 public and 10,629 private elementary schools and 7,976 public and 5,447 private high schools. Of 14.479 million elementary pupils, 92 percent were enrolled in public schools, while 81 percent of the 7.281 million high school students were served by the public sector. Private colleges and universities numbered 1,699 and enrolled 57 percent of higher education students, while the public sector included 112 state universities and colleges (SUCs) with satellite branch campuses. In addition, there were 95 institutions maintained by local governments, i.e., local universities and colleges (Table 1). All basic education is under the authority of the Department of education (DepEd) while higher education institutions (HEIs) are under the Commission on Higher education (CHED). SUCs however have charters from Congress and obtain their individual budgets from it. Indeed, SUCs have

greater autonomy from CHED than even private HEIs.[1] On the other hand, local universities and colleges are established and maintained by local governments and appear to be almost independent of CHED.[2]

TABLE 1. Structure and growth of the education system

		1980	1990/91	2001/02	2013/14
A. Number of schools by level					
Elementary	Public	30,311	32,449	30,069	38,648
	Private	1,183	1,632	4,193	10,629
	Total	31,494	34,081	34,262	49,277
High school	Public	3,112	3,394	4,336	7,976
	Private	2,032	2,156	3,168	5,447
	Total	5,144	5,550	7,503	13,423
	HS in SUCs	81	-	-	-
	National Comprehensive HS	140	-	-	-
	Vocational/Technical HS	560	-	-	-
	Barangay HS	2,092	-	-	-
Tertiary	Higher education				
	1. Public	298	174	405	673
	SUCs Main	48	-	111	112
	SUC satellites	-	-	247	451
	LUCs	-	-	42	96
	Community colleges	45	34	-	-
	Non-chartered colleges	205	59	-	-
	Others	-	-	5	14
	2. Private colleges and universities	596	635	1,258	1,699
	3. Sectarian colleges	-	-	320	359
	Total	894	809	1,663	2,372
B. Enrollment (in thousands)					
Elementary	Public	7,817	9,727	11,838	13,301
	Private	410	700	923	1,178
	Total	8,227	10,427	12,760	14,479
High school	Public	1,490	2,564	4,156	5,928
	Private	1,277	1,470	1,246	1,358
	Total	2,767	4,034	5,402	7,281
Higher education	Public	n.d.	n.d.	808	1,539
	Private	n.d.	n.d.	1,657	2,025
	Total	n.d.	n.d.	2,465	3,564

Sources: *Department of education College Statistical Bulletin* 1979-80, 1990/91, 2016, *CHED Statistical Bulletin* 2013/14

[1] The law requires CHED to submit the SUCs' budget for congressional appropriation and to appoint a CHED commissioner to head each SUC board of regents. This means the seven CHED commissioners must spread themselves among 112 SUCs. There are, however, CHED regional offices to monitor the regions' SUCs. CHED exercises greater authority over the private higher education institutions. It approves their establishment and program offerings and undertakes some quality evaluation. The local universities and colleges appear to be independent of CHED as they were established without its authorization.

[2] The statutory levers of CHED's authority or influence over local universities and colleges remain ill-defined and remain a subject of contention. These institutions may be established and may offer programs without CHED accreditation.

Both the number of schools and enrollment at each education level have grown consistently. From 1980 to 2014, the total number of elementary schools rose from 31,494 to 49,277; high schools from 5,144 to 13,423; and HEIs from 894 to 2,372. Until 1994, public high schools were administered and financed from different public sources and had varying curricula. There were comprehensive high schools, barangay comprehensive high schools, and vocational high schools. At the tertiary level, there were chartered state universities and colleges, non-chartered public and community colleges, and private sectarian and non-sectarian schools.

The school system was reorganized in the mid-1990s. The Department of education and Culture, which until then had been in charge of the whole educational system, was divided into three administrative authorities: the DepEd for elementary and high school education; the CHED; and the Technical and Skills Development Authority for vocational skills training. The various types of secondary schools were integrated into one national high school system, and the various types of public tertiary schools were classified into vocational schools and higher educational institutions. Vocational schools which had presumably met the criteria for higher education institution status were converted into colleges, while some colleges developed into universities. New SUCs were directly established by Congress. The table also shows the disappearance of various types of high schools and vocational schools since the mid-1990s.

The growth of enrollment from 1980 to 2014 is also seen from the same table: from 8.227 million to 14.479 million at the elementary level; from 3.767 million to 7.281 million for high school; and from 1.706 million to 3.563 million at the college level. Growth rates over the period were respectively 56 percent, 161 percent, and 165 percent. The faster growth of high school enrollment may be explained by the integration of the barangay or community high schools into the national high school system and by the program granting tuition subsidy to students who could not be accommodated in existing public high schools. Barangay high schools organized and partly financed by their communities appear to have had inferior facilities and teachers and so did not attract as many students as the national high schools. The increasing number of high school graduates then put pressure to expand higher education, particularly the SUCs and the LUCs.

Amid a general concern for expansion, some attempts were made to provide quality programs. The DepEd instituted two programs to provide higher quality education for selected (brighter) pupils. In the fast-learner program, brighter and more disciplined pupils in each grade are grouped in separate sections and provided with more learning materials and better teachers. National science elementary schools and science high schools were also established. There are now 432 science elementary schools and 95 science high schools spread over the provinces. These schools follow a curriculum heavier in science courses and are given extra budget support for laboratory and supplies. In 2014-2015, the science elementary schools

enrolled 69,433 students and the science high schools, 43,746 in 2015. Still these accounted only for 0.5 percent and 0.7 percent of public elementary school enrollment and public high school enrollment, respectively. In a separate track, the Department of Science and Technology runs 16 schools under the Philippine Science High Schools (PSHS) system, one school for each region as well as a main campus. These schools follow a common curriculum that emphasizes science and mathematics and are given separate and large appropriations from the national budget. All of the schools in the PSHS system offer free tuition and a stipend to all students and further living allowances to students in need. However, enrollment is limited to 8,000 per year, and numerous applicants have had to be turned away. In 2015 for instance, 22,791 applied, but only 1,355 passed the screening.

The higher education system has evolved from what was an essentially private system to one with a fairly large public sector that now absorbs 42 percent of tertiary students. Until the late 1950s, there was only one state university, the University of the Philippines (UP), which was established by the American colonial government in 1908. The Americans also established the Philippine Normal School in 1906 to train teachers for the new and fast-growing public schools. The same period also saw the establishment of vocational/technical schools for training in clerical work, construction skills, and agriculture. Most of the original vocational/technical schools decided to develop their programs into degree programs and got legislative approval to convert their schools into colleges. From only one university until the late 1950s, the number of SUCs grew to the current 112. Once established, many SUCs themselves followed the expansionary trend by establishing branches. The 112 SUCs now have 451 satellite campuses. UP itself increased its branches from one agricultural campus in 1950 to eight campuses now. From its origins as the small Philippine College of Commerce, the Polytechnic University of the Philippines is now the country's largest SUC, with enrollment reaching 80,000 in its numerous branches.

Manasan [2015] observes that public HEIs offer programs similar to those of private HEIs. This is confirmed by our own data. Both sectors offer the three most popular programs: business management, teacher training and engineering, and IT-related degrees (Table 2). In 2011-2012, graduates in these fields in private HEIs comprised, respectively, 29.3 percent, 9.1, 5.7, and 12.4 percent of HEI graduates. The corresponding figures in public HEIs are 23.9, 19.1, 17.7, and 13.3 percent.

TABLE 2. Percent Distribution of Higher Education Graduates By Discipline Group, Program Level: Private and Public HE, 2011/12

	Panel A: Private Higher Education Institutions						Panel B: Public Higher Education Institutions					
Discipline group	Pre-bacc.	Baccal	Post-bacc.	Master's	Doctorate	Share of discipline	Pre-bacc.	Baccal.	Post-bacc.	Master's	Doctorate	Share of discipline
Agriculture, Forestry, Fisheries	4.1	92	2	1.3	0.7	0.2	23.5	72.2	-	3.1	1.1	5
Architecture and Town Planning	2.4	97.5	-	-	-	0.4	16.7	73.9	3	6.1	0.3	0.5
Bus. Adm. and related	5.7	88	-	5.9	0.3	29.3	17.6	80	0.2	2	0.2	23.9
Education science and Teacher Training	0.7	73.8	1.4	21.5	2.6	9.1	1.4	82.8	4.7	9.8	1.4	19.1
Engineering and Tech	2.7	95.4	0.1	1.2	-	5.7	37.1	62.1	0.3	0.3	0.3	17.7
Fine and Applied Arts	0.4	98.7	-	0.9	-	0.5	31.9	50.4	0.1	17.4	0.1	0.7
Humanities	0.7	91.1	-	5.2	3	0.9	-	84.6	-	8.1	7.2	1.3
IT-Related Disciplines	20.5	78.9	-	0.5	-	12.4	32.2	67.4	-	0.3	0.2	13.3
Law and Jurisprudence	-	98.9	-	1.1	-	0.8	-	98.4	-	1.6	-	-
Maritime	21	76.9	2	-	-	5.7	27.8	72.2	-	-	-	1.2
Mass Communication and Documentation	0.2	96.9	-	2.9	-	1.1	0.6	95.3	0.4	2.6	0.7	0.9
Mathematics	-	78.3	-	21.1	0.6	0.02	1.2	91	-	7.3	0.5	0.8
Medical and Allied	4.9	91.5	-	3.6	-	23.1	16.5	79.9	-	3.6	-	5.2
Natural Science	-	93.4	1.2	4.8	0.6	0.5	-	91.1	1.3	6.2	1.3	1.3
Social and Behavioral Sciences	-	97.1	-	2.4	0.5	2.7	-	92.6	-	6.6	0.8	2.6
Others	6.7	88.7	-	4.1	0.5	7.8	38.6	58	1.3	1.4	0.7	6.5
Share by program level	7.3	8.7	0.1	5.3	0.4	100.0	20.0	74.3	1.2	3.8	0.6	100.0
Total number of graduates	21,865	260,034	535	15,788	1,246	299,468	44,748	165,867	2,570	8,528	1,389	223,102

Source of basic data: CHED Statistical Bulletin 2013-2014.
Note: Row entries per field in each panel sum up to 100 except for rounding errors.

Mathematics and the natural sciences degrees were earned by only 1.2 percent of HEI students. Only a handful of HEIs offer these fields, to begin with. More mathematics and natural science graduates are produced by SUCs than by private HEIs: 2.1 vs. 0.5 percent respectively for the relevant years. Relatively few graduates go on to pursue advanced degrees. Of the 522,570 degrees completed in 2012-2013, only 2,635 were doctoral degrees, or 0.5 percent of total degrees. Only 56 were doctoral degrees in mathematics and the natural sciences. While engineering is a popular baccalaureate program, only 118 out of 56,558 graduates received doctorates in this field. The bulk of doctoral graduates (49.5 percent) were found in teacher training (1,305 of all doctoral graduates). The preference for graduate degrees in teacher training is unsurprising given the large job market for this field and the resulting competition based on credentials. By contrast, only meager employment opportunities are available to Ph.D. graduates in science and technology fields. The government itself devotes only a fraction of one percent of its budget on science and technology research [Tan 2002]. There are no specialized public or private R&D centers, and only a handful of universities offer positions for research or advanced instruction in these fields. In contrast, teachers with master's degrees or better qualify for higher positions in the education system. Financial institutions and large enterprises employ workers with higher degrees in business management, but even here MBAs will typically suffice for advancement.

Current costs per student in SUCs exhibit a wide variation with annual figures ranging from ₱7,131 (Adiong Memorial Polytechnic State College, Region XII) to ₱143,146 (Philippine Merchant Marine Academy).[3] UP spends ₱84,402 per student, the highest among regular SUCs. As the country's premier university, UP has been treated as a special case and given consistently high budgetary support. The Philippine Merchant Marine Academy, however, required even higher maintenance cost and had the highest cost per student. Most SUCs spent less than ₱20,000 annually per student, and ten even spent less than ₱10,000. Note that the per-student cost in the public school system averaged cost of ₱14,600. This raises the question of what quality of program such SUCs could provide for ₱10,000 a year. Other reputable SUCs such as the Central Luzon State University and the Philippine Normal University had current costs per student of ₱37,144 and ₱32,897, respectively. Except for UP, most SUCs allocated less than 5 percent of their budget to research. Personnel expenses absorbed the bulk of SUC budget which left little for laboratory and library facilities. Even UP spent 73 percent of its current budget on personnel. Aside from tuition subsidies—before the free-tuition law was passed—SUCs already provided financial assistance for living and other costs to a small percentage of students. UP in particular implemented a financial assistance program offering free or discounted tuition plus graduated living subsidies based on a means-test.

[3] Data available from the author upon request.

SUCs are required to report their performance in professional licensure examinations the report on expenditures they submit to the Department of Budget and Management. Most SUCs performed better than average, with UP reporting a passing rate that is twice the national average. Cebu Normal College had a 2.53 ratio, higher than that of the Philippine Normal University at 1.39. On the whole, the SUCs perform better than private HEIs in professional licensure examinations.

3. Education finance

The rapid expansion of the education system occurred at a time the country's per capita income was still relatively low and unequally distributed, and the government faced problems raising revenues. This set severe limits on the resources that both the private and public sectors could devote to education. Opting for an expansionary policy virtually implied choosing quantitative development of the education system over selective high-quality education. The low per-student expenditures on education described above were an outcome and major reason for its inferior provision. Higher quality could probably have been achieved with the same budgets if a more concerted effort had been directed to the production of good teachers and textbooks and the application of more effective education technologies, including information technology. But government attention was focused on meeting current demands for education. Private schools were thus allowed to offer programs the quality and orientation of which more families could afford. Virtually all HEIs were fully dependent on school fees, given the meager wellsprings of philanthropy for education in the country. Congress chartered SUCs to be of a similar character as private HEIs. There is little or no interest or intent to establish SUCs as high quality institutions or as centers for science and technology development. This latter is evident in the continuing preponderance of undergraduate degree production even in UP, supposedly the country's premiere research university.[4]

The national government allocates some 15 percent of its budget to education. The budget for basic education is coursed through the DepEd, but SUCs get their individual budgets directly from the Congress. The PSHS system also merits a separate appropriation under the Department of Science and Technology. In 2014-2015, the average budget per student in the public school system was ₱14,599, in the SUCs ₱29,141, and in the PSHS ₱170,799 (Table 3). The large budget given to the PSHS system could stand further scrutiny. An open question is whether such an amount could have been more effectively used in upgrading the science and technology departments of an SUC or a private HEI.

[4] At the flagship campus UP Diliman, the ratio of undergraduate degree to advanced degree finishers (i.e., diploma, master's, and doctoral degrees) in 2016-2017 was 3.88 (i.e., 3,666 to 944). At the National University of Singapore, this ratio was 1.4 (i.e., 6,782 to 4,371).

TABLE 3. Budget per student in public high schools, Philippine Science High Schools, and state colleges and universities, 2015

	Budget	As % of total budget	As % of current outlays
A. Public high schools			
Total (in ₱ millions)	280,724	100.0	
Personnel	194,331	69.2	84.90
Maintenance and other operating expenses	34,599	12.3	15.10
Capital outlay	51,794	18.5	
Total budget per student	14,599		
Current budget per student	11,905		
(Budget for textbooks)	4,060	1.4	1.80
Memorandum: Enrollment (thousand students)	19,299		
B. Philippine Science High School (2015)			
Total (in ₱ millions)	1,109	100.0	
Personnel	371	33.5	
Maintenance and other operating expenses	398	35.9	48.20
Capital Outlay	341	30.7	51.80
Budget per student (target)	138,625		
Budget per actual student (in ₱)	170,799		
Current budget per student (target in ₱)	118,843		
Memoranda: Enrollment target (no. of students)	8,000		
Actual enrollment (no. of students), 2015	6,493		
C. State Universities and Colleges			
Total (in ₱ millions)	41,263	100.0	
Personnel	22,644	54.8	68.60
Maintenance and other operating expenses	10,366	25.1	31.40
Capital Outlay	8,254	20.0	
Budget per Student (in ₱)	29,141		
Current budget per student (in ₱)	23,312		
Memorandum: Enrollment (thousand students)	1,416		

Source: DBM, National Expenditure Program, 2015; NSO 2015 Statistical Yearbook; Philippine Science High School; Commission on Higher education

The DepEd's special science schools obtain larger allocations than their regular counterparts. Each national science school is given an extra budget of ₱144,000 plus an amount equal to ₱500 per student (DepEd Order No.48, dated 2011). Enrollment in each school is limited to 320. In 2015, the total budget per student in the DepEd science schools amounted to only ₱15,550 (= ₱14,600 + ₱950). There is an evident disparity between this and the far larger budget per student of the PSHS.

Tuition fees in private HEIs vary widely, ranging from ₱135 to ₱3,225 per credit unit in 2015 (Table 4). Total fees for each degree program also depend on the curriculum or course content and the credit units assigned for each course. Most bachelor degree programs require about 40 credit units of coursework per school year. Other fees may include charges for laboratory, library, and extra-curricular activities and could amount to 10 percent of tuition. Tuition fees tend to be lower in provincial areas than in Metro Manila. About 140 HEIs charged less than ₱200 per credit unit, and 386 HEIs, ₱200-300. A decreasing number of HEIs charge increasingly higher fees. The three highest ranking private HEIs—Ateneo de Manila, De La Salle University, and the University of Santo Tomas—charge high but differing fees, respectively ₱3,328, ₱2,219, and ₱2,014 for their Manila campuses. Both Ateneo and De La Salle charge significantly lower fees in their provincial campuses. The highest tuition of ₱3,225 is charged by the Asia Graduate School of Theology. Listed in Table 5 are the familiar private HEIs of older establishment such as the Far Eastern University, University of the East, Lyceum of the Philippines, Mapua Institute of Technology, San Beda College, San Juan de Letran College, Silliman University, San Carlos University, and sectarian schools for girls. Their fees are much higher than the average but also differ from each other. Medical, aeronautical, and maritime schools charge higher fees. To what extent do fees determine quality or at least performance in the professional licensure examination? The lowest fee of ₱135 per unit will run approximately to total fees of ₱8,800 per year, a figure even lower than the average budget of ₱14,600 per student in the public school system. This begs the question what quality of education an HEI with such a level of income can produce.

TABLE 4. Distribution of tuition fees per credit unit in private higher education institutions and in state universities and colleges, 2015

Tuition fee range (₱ per credit unit)	Number of HEIs	% of total
Panel A: Private higher education institutions		
< 200	144	9.2
200-300	386	24.8
301-450	368	23.4
451-550	291	18.5
551-750	193	12.3
> 750	189	12.0
> 1,000	119	7.6
Total	1,571	100.0
Panel B. State universities and colleges		
10-25	2	1.8
30-35	3	2.7
50-90	12	10.8
100-140	45	40.5
150-180	25	22.5
200-250	13	11.7
550	1	0.9
1,000	1	0.9
2,500	1	0.9
n.d.	8	7.2
Total	111	100.0

Source: Commission on Higher education

TABLE 5. Tuition fees per credit unit in some well-recognized HEIs, 2015 (in pesos)

	Institution	Tuition fee per credit unit
1	Ateneo de Manila	3,328
	Ateneo de Davao	1,240
	Ateneo de Zamboanga	1,239
	Ateneo de Naga	1,097
	Xavier University Cagayan de Oro	1,000
2	De La Salle University Manila	2,219
	St. Benilde University	2,177
	DLSU Lipa/Cavite	1,167/1362
	DLSU Health Sciences Institute	1,488
	DLSU Araneta	1,184
3	University of Santo Tomas	2,041
4	San Juan de Letran University	1,293
5	San Beda College: Manila/ Albay	1,879/1,595
6	Mapua Institute of Technology	1,477
7	Far Eastern University	1,697
	FEU Institute of Technology	1,545
	FEU Makati	1,578
	FEU Medical School/FERN	1,918/1,010
8	University of the East Caloocan	1,444
	UERMMS	1,634
9	FEATI	3,062
10	Lyceum University Manila	1,603
	Lyceum Batangas/Laguna/Quezon	1,022/1,095/1,135
11	Philippine Women's U Manila/Quezon City	1,210/1,000
12	Don Bosco Inst. of Technology	1,017
13	Adamson University	1,313
14	Centro Escolar University	891
15	College of the Holy Spirit	960
16	La Concordia College	1,016
17	Assumption College	1,915
18	Miriam College	2,087
19	St. Joseph College	1,033
20	St. Paul College Manila/Quezon City	1,468/1,219
21	St. Scholastica's College	1,728

Source: Commission on Higher education

4. Access to education

Access to education is considered here in the context of the structure of country's educational system and the level and distribution of income. Family income will obviously be the principal determinant of the education decision given other factors influencing the choice faced by the decision-maker (i.e., costs and expected returns). The cost of education includes school fees, distance-related costs, and foregone income. Cost generally increases with the level of education. It also increases as quality rises. While tuition is free in all public schools, cost is higher for public high school and college levels than for public elementary schools. Distance-related cost is lowest at the elementary level, since elementary schools are spread over all barangays as a matter of policy. There are more than 49,000 elementary schools spread over some 42,000 barangays. High schools are mostly located in larger villages and towns, while colleges and universities are in large towns and cities. Most high-quality HEIs are located in the national capital region and regional centers such as the cities of Cebu, Baguio, Davao, and Cagayan de Oro. For these reasons, access is expected to be more difficult at higher levels and for higher quality education because of their higher distance-related cost.

Access to the best HEIs can be expected to be most unequal. This inequality is heightened by the sparseness of high-quality HEIs themselves and by the inferior quality of basic education, which fails to prepare especially poor students for college. Poor students who enroll in low-quality public schools and who are raised in a home environment with meager learning facilities and parental encouragement are less able to compete for admission in high-quality HEIs. Admission data for UP provides enough evidence of the problem. Until recently, UP implemented a socialized tuition fee scheme under which graduated tuition discounts are granted to students depending on their family income. Family income is classified according to income ranges or brackets from less than ₱100,000 per year to ₱1 million or more. A 100 percent tuition discount is granted to students in the lowest two brackets, while the top bracket pays full tuition cost. Students in the lowest two brackets are also given financial support for living expenses and books. Of 48,486 high school graduates who applied for admission to UP Diliman in 2012, only 7.9 percent, or 3,821 students, qualified. Admission, which requires passing a standard examination, varies greatly across income brackets, the lowest at 3.5 percent among applicants from the poorest families, rising monotonically with income and reaching 16 percent for students coming from millionaire families. Tuition fees at UP represent only about half the current cost per student, which means that although the affluent pay "full tuition cost", they get the bulk of the benefits from the total subsidy since they comprise the majority of admitted students. Top private universities like Ateneo and De La Salle also have need-based scholarship programs, but, as in case of UP, few of the poorest students who have obtained their basic education in poor quality schools

qualify under the institutions' admission criteria. The foregoing strongly suggests that academic preparation and not financial costs may be the main obstacle to poorer students gaining access to quality higher education.

TABLE 6. Percentage distribution by family income of applicants, qualifiers, and qualifying rates at the University of the Philippines–Diliman (2008 and 2012)

Level	Annual family income range (in ₱ thousands)	2008			2012		
		Applicants (%)	Qualifiers (%)	Qualifying rate* (%)	Applicants (%)	Qualifiers (%)	Qualifying rate* (%)
0	No data	8.6	3.5	8.1	7.1	3	3.4
1	< 100	17.8	9.4	15	12.5	5.5	3.5
2	101-200	21.1	15.4	19.5	18	13.1	5.7
3	201-300	13.8	12.8	13.7	13.1	9.7	5.8
4	301-400	8.8	9.9	9.1	9.4	9.1	7.6
5	401-500	7.1	9	7.6	8.4	8.5	8.4
6	500-1,000	13.9	21.4	16.1	18.7	24.4	10.3
7	> 1,000	8.9	18.5	10.9	13.1	26.6	16
	Total (%)	100	100	100	100	100	100
	Total number	40,084	3,826	45,178	48,486	3,821	7.9

*Qualifiers as a percentage of applicants
Source: Office of Admissions, University of the Philippines–Diliman

Reproduced here as Table 7 is the table from Reyes et al. [2015], which shows how the enrollment rate of children falls with age, the rate of decline again depending on family income. At age 6-11 years, enrollment rates do not differ greatly across income groups: 94.4 percent for the poorest and 99.3 percent for the richest decile. More than 95 percent of children aged 6-11 from the second decile were enrolled; these ages correspond to grades 1 to 6. The enrollment rate of children aged 12-14 years, corresponding to high school, drops to 87.1 percent for the poorest. Enrollment rates for those aged 15-18 years, corresponding to the first years of college education, fall drastically for all deciles except for the richest two deciles.

TABLE 7. Percentage of children attending school, by income group and by age group, 2011

Age range (yrs.)	Income Decile*									
	1	2	3	4	5	6	7	8	9	10
6-11	94.4	96.6	97.2	97.4	98.0	98.3	98.8	99.0	99.4	99.3
12-14	87.1	92.0	92.9	93.4	95.7	97.0	97.4	98.5	99.3	99.4
15-18	49.8	54.5	58.6	62.6	62.8	69.9	73.5	81.4	88.9	93.3

*1 = poorest; 10 = richest
Source: Reyes, et al. [2015] from Annual Poverty Indicators Survey 2011..

In another paper [Tan and Siriban 2017] we show that almost 40 percent of the youth from the poorest income decile stop at the elementary level, as compared to only 2.5 percent of the youth from the top income decile. A fairly high percentage, 53 percent, reach high school with 18 percent graduating. However, only 6.3 percent got to college with only 1 percent completing it and 3.2 percent still enrolled. This is to be compared with the attainment to the youth in the highest income decile where 2.5 percent stop at the elementary level, 22.6 percent stop at high school, and 68.7 percent stop at college. Among those who reach college, 25 percent graduate, 37 percent are still enrolled, and only 7 percent fail to complete. College attainment and college completion rate rise monotonically with family income.

A recent study [Adorna 2017] that looks into schooling choices faced by young high school graduates validates the hypothesis of household income as the central variable of concern. The study finds the probability of enrolling in public HEIs to be positively affected by whether the family head is employed, the family's access to credit, the student's age, whether the student belongs to a family in 4th and 5th (i.e., the two richest) income quintiles, and whether the mother attained a post secondary-tertiary level of education. The propensity to enroll in private HEIs (as measured by the relative risk ratio) is significant and stronger for the same variables compared to enrollment in public HEIs, indicating a preference for the former.[5] These and similar findings imply that weightier socioeconomic factors impinge upon the decision to continue education and the type of school to attend. Given their relative magnitudes in the cost-benefit calculus, tuition and direct fees alone are unlikely to be the binding constraints in the decision to pursue a college degree.

5. Quality of education

Poor quality and the neglect of advanced studies in science and technology are the other pressing problems of Philippine education. Domestic and international data on quality show Philippine education to be inferior not only relative to education in more advanced economies but also relative to that in the Asian tigers and key Southeast Asian neighbors.

A direct benchmark comparison is provided by the results of the Trends in the International Mathematics and Science Study (TIMSS), a series of international tests of student achievement conducted every three years, which the Philippines joined in 1999 and 2003. Unfortunately, the country's participation stopped after 2003. The Philippines has also not participated in the Program for the International Study of Student Achievement.

In the 1999 TIMSS test of Grade 8 pupils, the Philippines' average score in both mathematics and science was 345. This score was 41 percent below the

[5] Interestingly, receipt of remittances is not a significant variable in explaining enrollment in public HEIs but is significant for enrollment in private HEIs. Adorna [2017] argues that remittances increase family income but that these are already captured by the income variable.

international average in both subjects. It was also 75 percent and 65 percent lower than the score of the highest achievers in math and science, respectively.[6]

Indeed, the country ranked third-lowest among 38 countries, with Morocco and South Africa at the bottom.

The country fared somewhat better in the TIMSS 2003 test for Grade 8, scoring 81 percent and 80 percent of the international average, respectively, for mathematics and science. These scores were still significantly below the international average, however (Table 8, last four columns). It was an ominous development furthermore that Grade 4 pupils in 2003 were even farther below the international average. The Philippines scored 358 in mathematics and 332 in science, or 72 percent and 68 percent of the respective international averages for those subjects at the Grade 4 level (Table 8, first four columns). The country remained in the third or fourth position from the bottom among the participants. Singapore, Taipei China, Hong Kong, and Japan topped the test for several years, the same countries that have topped the Program for the International Study of Student Achievement tests. Malaysia and Indonesia typically performed better than the Philippines in the TIMSS tests, with Malaysia scoring better than the global average.

TABLE 8. TIMSS ranks and scores of Grade 4 and Grade 8 pupils in selected countries, 2003

Grade 4 pupils				Grade 8 pupils			
Rank and country*	Math Score	Rank and country*	Science Score	Rank and country**	Math Score	Rank and country**	Science Score
1. Singapore	594	1. Singapore	565	1. Singapore	605	1. Singapore	578
2. Hong Kong	575	2. Taipei	551	2. Korea	589	2. Taipei	571
3. Japan	565	3. Japan	543	3. Hong Kong	586	3. Korea	558
4. Taipei	564	4. Hong Kong	542	4. Taipei	585	4. Hong Kong	556
5. Belgium	551	5. England	540	5. Japan	570	5-6. Japan	552
6. Netherlands	540	6. US	536	6. Belgium	537	8. Netherlands	536
10. England	531	8. Hungary	530	10. Malaysia	508	9-10. US	527
12. US	518	9. Netherlands	525	15. US	504	20. Malaysia	510
Average	495	Average	489	Average	467	Average	474
22. Iran	389	22. Iran	414	34. Indonesia	411	36. Indonesia	420
23. Philippines	358	23. Philippines	332	40. Morocco	387	39. Morocco	396
24. Morocco	347	24. Tunisia	314	41. Philippines	378	42. Philippines	377
25. Tunisia	339	25. Morocco	304	42. Botswana	366	43. Botswana	365
				44. Ghana	276	44. Ghana	255
				45. South Africa	264	45. South Africa	244

*25 participating countries; **43 participating countries
Source: IEA [2004a: 34, 35] and IEA[2004b: 36, 37].

[6] The international average scores in TIMSS 1999 were 487 for math and 488 in science. The top scorers were Singapore in math and Taipei in science.

While international benchmarking of basic education has been discontinued—an anomaly in itself—DepEd still regularly conducts achievement tests for elementary and high school students. Table 9 gives the average performance of grade 6 and 4th Year high school students in 2011/2012 and 2014/2015. In what may be a hopeful trend, elementary students perform better than high school students in the learning competences for their respective levels, as set by DepEd. Grade 6 students in 2014/2015 averaged 69.1 percent in five subjects, with little variation in their per-subject average scores. They scored best in mathematics at 69.7 percent but poorest in English at 66.3 percent. Fourth-year high school students on the other hand averaged only 49.5 percent, doing best in Filipino, with an average of 59.2 percent but averaging below 50 percent in all other subjects. Like the grade 6 students, they performed worst in English with a grade of 46.6 percent.

TABLE 9. Achievement Rates for Grade 6 and 4th Year High School (School years 2011/2012 and 2014/2015, in percent)

	Grade 6		4th Year High School	
	2011/2012	2014/2015	2011/2012	2014/5015
Overall	66.8	69.1	48.9	49.5
Mathematics	66.5	69.7	46.4	47.4
Science	66.1	67.2	40.5	46.6
English	67.1	66.3	51.8	46.5
Filipino	69.2	68.9	51.3	59.2
Social Studies	66.0	67.9	54.2	48.8

Source: DepEd education Management; 2017 Key education Statistics

Poor performance in high school is consistent with the already known low TIMSS performance for Grade 8 students in 2003. Properly delivering the high school curriculum requires more laboratory equipment and supplies for science subjects and higher standard of textbooks and of teachers than are being currently provided. Budgets allotted to public high schools meanwhile are likely to be even less adequate to meet the competences set for this level than that for the elementary level. Such inadequacies are reflected in the enormous difference in the budget per student granted to schools in the PSHS system and that given to the regular public high school. Students of DepEd science high schools which were given an extra ₱950 per year performed better than the regular high school students. (Table 10). (Only in Region 8 did science high school students fail to perform better than regular high school students.) It is tempting to conclude from this that a small budget increment allocated to non-personnel inputs is responsible for a significant improvement in their students' science and math achievement. While there is possibly that factor to be considered, the improvement is at least also due to the selectivity of admissions into the high school science program.

TABLE 10. Average scores of students in DepEd Science High Schools across regions, 2013/2014

Region	Science High Schools		Regular High Schools	
	Mathematics	Science	Mathematics	Science
1	72.7	78.9	43.8	38.2
2	71.3	81.1	51.9	43.7
3	74.1	75.7	50.7	45.3
4A	-	-	41.6	37.3
4B	74.5	76.7	57.5	47.9
5	54.8	70.3	48.4	42.1
6	83.6	87.4	56.4	48.9
7	-	-	59.6	49.3
8	46.7	58.7	62.9	53.3
9	-	-	61.4	52.6
10	68.6	73.7	54.8	47.6
11	70.8	69	55.2	48.9
12	-	-	55.6	46.2
Caraga	79.5	69.5	47.7	36.0
CAR	73.1	77.3	49.9	43.7
NCR	68.8	93.2	51.4	44.3

Source: DepEd

In any case, resource-constraints remain a problem in basic education, particularly for non-personnel-related items such as learning materials and basic facilities. Table 11 shows that all schools, except those in the national capital region, have at most only two toilet bowls, most likely one for girls and one for boys. Yet each school typically accommodates hundreds of pupils. Most schools have water supply but of unspecified source. Village schools are unlikely to have safe drinking water. The average number of computers per school ranges from three in ARMM to 13.8 in Region 3. Who could use the few computers in one school? The schools in the national capital region have the highest rate of internet connection at 83 percent, but only a small percentage of provincial schools have an Internet connection. There is apparently also no provision for the establishment of libraries and laboratories.[7]

[7] This author's recent visit to the central public elementary school of a first-class town revealed no library or laboratory supplies. There was a large clean room with chairs and shelves, but these were empty. Not even a newspaper was available. A visit to a village school reveals the same desolation. The political clamor for education support has been directed to benefit teachers, not the students who need good books and laboratory equipment.

TABLE 11. Facilities in public elementary schools by region

Region	Total Number of Schools	Total (Toilet Bowls and Urinals)	Toilet Bowls per School	Number of Computers per School	Percent with Internet Connection	Percent with Water Supply (All Sources)
1	2,399	4,466	1.9	8.7	51	92
2	2,200	3,916	1.8	7.2	30	88
3	3,002	5,320	1.8	13.8	28	92
4-A	2,732	5,590	2.0	12.0	52	91
4-B	1,856	3,156	1.7	5.3	24	67
5	3,146	5,539	1.8	8.0	19	73
6	3,399	6,737	2.0	6.9	23	88
7	2,939	5,012	1.7	11.8	29	81
8	3,640	6,129	1.7	6.1	12	75
9	2,124	3,527	1.7	11.1	13	75
10	2,097	3,312	1.6	6.9	22	27
11	1,669	2,588	1.6	6.4	21	82
12	1,745	3,397	1.9	9.9	18	81
Caraga	1,663	2,475	1.5	6.6	17	76
ARMM	2,145	2,051	1.0	3.0	3	53
CAR	1,530	2,855	1.9	5.1	27	83
NCR	517	1,572	3.0	6.1	83	87
Total (or Average)	38,803	67,642	1.7	8.7	24	80

Source: Department of education

The quality of the country's higher education appears to be even lower than that of basic education in relation to international standards. Here international comparisons are still possible. In the 2016-2017 QS ranking of the world's 1,000 best universities and institutes in terms of academic reputation, citation of research work, employers' assessment of graduates, and domestic and foreign faculty-student ratios, the country's four best universities ranked low, with UP in 374th position, Ateneo de Manila University in the 501-550th range and De La Salle University and the University of Santo Tomas in the bottom 701.

For comparison, Table 12 also gives the rankings of some top universities in the world and the top universities from ASEAN countries. It will be noted that a significant number of Asian and ASEAN universities have developed into very high quality academic institutions comparable to many of the world's best universities. Singapore achieves the highest ranking in Asia with the National University of Singapore in 12th position and Nanyang University in 13th position. These two rank even higher than some Ivy League universities (Cornell and Yale). Hong Kong has four universities in the top 100 (not all shown), with the University of Hong Kong rating slightly higher than UC Berkeley. The top universities in Malaysia, Thailand, and Indonesia are all ranked higher than UP. The Philippines fares even worse in other rankings. In the 2017 Times Higher education Supplement rankings, only one Philippine university (UP) can be found

among the 1,000 best universities. By comparison, Indonesia has three in the list, Pakistan four, Thailand nine, Malaysia eight, and India 30.[8] In the more stringent Academic Ranking of World Universities (covering the top 500 and originally published by Shanghai Jiaotong University), no Philippine university makes the grade.

TABLE 12. Overall rating and academic reputation of selected top world and ASEAN universities 2016/2017

Overall Rank	University	Overall Rating	Academic Reputation
1	Massachusetts Inst of Technology	100	100
3	Harvard University	98.3	100
4	University of Cambridge	97.2	100
11	Princeton University	92.8	100
12	National University of Singapore	91.5	100
13	Nanyang University	91.4	91.6
15	Yale University	90.9	100
16	Cornell University	90.1	99.6
24	Tsinghua University	86	99
27	University of Hong Kong	85.4	98.9
28	U of California Berkeley	85.2	100
34	University of Tokyo	82.6	100
35	Seoul National University	82.1	72.9
39	Peking University	81.3	88.8
133	Universiti Malaya	57.1	55.7
252	Chulalongkorn University	40.6	68.9
270	Universiti Putra Malaysia	38.8	43.2
283	Mahidol University	37.6	45.8
288	Universiti Technologi Malaysia	37.4	n.a.
302	University Kebangsaan Malaysia	36.7	40
325	Universitas Indonesia	35	42.6
330	University Sains Malysia	34.6	40.3
374	University of the Philippines	31.5	42.5
501-550	Ateneo de Manila University	n.a.	30.4
701+	De La Salle University	n.a.	n.a.
701+	University of Santo Tomas	n.a.	n.a.

Source: QS Top Universities 2016/2017. Available from: https://www.topuniversities.com/university-rankings/world-university-rankings/2016

International comparisons aside, an HEI's quality can also be gauged by the performance of its graduates in various professional licensure examinations [Tan 2015], passing which is a requirement for certification and practice as a professional in a field, say law or medicine. The Professional Licensure Board administers examinations in 48 fields including criminology and maritime

[8] It is significant that India and Pakistan are poorer than the Philippines in GDP per capita terms.

engineering, but the majority of examinees sit for only three fields: teacher training, engineering, and nursing. Table 13 tabulates the number of schools by passing rates in three key fields: teacher training, accountancy, and nursing. It will be noted that very few HEIs had passing rates of 80 percent to 100 percent in each field. Most had passing rates below 40 percent. The majority of HEIs have very small numbers of takers to begin with, possibly because of the small number of graduates or because graduates felt discouraged in taking the examination.

TABLE 13. Number of schools by passing rate in selected professional licensure examinations

	Passing rates					
Region/Licensure field	**80-100%**	**60-79%**	**40-59%**	**20-39%**	**< 20%**	**Too-few takers**
1. National Capital Region						
Teacher Training	5	14	16	28	13	114
Accounting	1	0	12	18	15	27
Nursing	12	11	21	24	5	25
2. Central Luzon						
Teacher Training	0	8	16	45	14	55
Accounting	0	1	9	8	6	32
Nursing	1	7	12	19	5	11
3. Central Visayas						
Teacher Training	1	10	16	30	14	42
Accounting	1	3	1	6	1	12
Nursing	6	3	10	8	2	3
4. Eastern Visayas						
Teacher Training	0	0	5	7	23	36
Accounting	0	1	1	5	3	3
Nursing	6	2	7	2	0	2
5. Bicol						
Teacher Training	0	1	12	37	16	52
Accounting	0	0	6	2	14	14
Nursing	2	4	3	12	1	0
6. Northern Mindanao						
Teacher Training	1	2	5	19	7	32
Accounting	0	2	2	5	4	22
Nursing	3	2	11	4	2	1

Source: Tan and Siriban [2017] using data provided by Commission on Higher education.

The CHED evaluates the quality of particular HEI programs or departments and awards those of high quality with the status of Center of Excellence or COE. It also awards the status of Center of Development for programs that CHED considers to show promise of raising their quality. Table 14 lists the number of COEs for each field in public and private HEIs. In 2013, 93 COEs were selected, 45 in public and 48 in private HEIs. The largest number of COEs (31 of the 93) were granted to teacher education programs. Few other programs merited COE status: only 6 in biology, 7 in chemistry, 9 in IT, and 6 in nursing. Science and mathematics COEs were concentrated in only six HEIs, with 21 in UP; 6 each in Ateneo de Manila, De La Salle University, and Central Luzon State University; 5 in the University of Santo Tomas; and 4 in Mindanao State University. Most COEs in science and mathematics are found in UP. Only two COEs were identified for medicine and four for veterinary medicine. There were no COEs in the large field of business management and accounting and also none in any field of engineering (Table 15)–an ironic state of affairs considering the heavy undergraduate student enrollment in those fields.

TABLE 14. Distribution of Centers of Excellence (COEs) among top higher education institutions, as of 2011/12

Name of Institution	Number of COEs
University of the Philippines	21
Of which:	
UP Diliman (Main Campus)	11
UP Los Baños	8
UP Manila	2
Ateneo de Manila University	6
De La Salle University	6
Central Luzon State University	6
University of Santo Tomas	5
Mindanao State University—Iligan	4
Total	48

Source: CHED Statistical Bulletin, 2013

TABLE 15. Number of Centers of Excellence by field of specialization, 2013

		COEs (number)		
	Programs	**Public HEIs**	**Private HEIs**	**Total per field**
1	Accountancy education	0		0
2	Agricultural engineering	2		2
3	Agriculture	4		4
4	Biology	4	2	6
5	Business administration education		1	1
6	Ceramic engineering			0
7	Chemical engineering			0
8	Chemistry	3	4	7
9	Civil engineering			0
10	Computer engineering			0
11	Criminology		3	3
12	Electrical engineering			0
13	Electronics & Communication eng'g		1	1
14	Entrepreneurship education			0
15	Environmental science			0
16	Fisheries	1		1
17	Forestry	3		3
18	Geology	1		1
19	Hotel & Restaurant Management		1	1
20	Industrial engineering			0
21	Information technology	3	6	9
22	Marine Science	1		1
23	Mathematics	3	2	5
24	Mechanical engineering	0		0
25	Medicine	1	1	2
26	Molecular biology	1	0	1
27	Nursing	2	4	6
28	Optometry			0
29	Pharmacy education			0
30	Physical therapy			0
31	Physics	1	2	3
32	Sanitary engineering	0	0	0
33	Statistics	1	0	1
34	Teacher education	10	21	31
35	Tourism	0	0	0
36	Veterinary medicine	4	0	4
Total		45	48	93

Ultimately the key aspect of the problem of quality is to be found in the weak faculties found in most of the country's HEIs. Only 14.3 percent of the faculty in the public HEIs held a doctoral degree (Table 16, Panel B). Those with master's degrees comprised 37.4 percent and almost half (48.3 percent) were only baccalaureate holders. The faculty roster in private HEIs is even poorer with only 9.8 percent holding doctorates, 39.5 percent masters, degree and 50.6 percent bachelor degree. Faculties in mathematics and the science had even lower

numbers of doctorate holders:12.7 percent, in mathematics, 16 percent and in natural science, or 14.5 percent for those two fields together. The 7.7 percent for engineering is even worse (Table 16).

TABLE 16. Distribution of higher education faculty by discipline and highest degree completed: 2012/13

	Baccalaureate degree holders %	Master's degree holders %	Doctoral degree Holders %	Number of Faculty
Panel A: Distribution by type of HEI				
Public HEIs	48.3	37.4	14.3	49,477
Private HEIs	50.6	39.5	9.8	86,001
Panel B. Distribution by field				
Agriculture, Forestry, Fisheries	33.9	40.4	25.7	3,103
Architecture and Town Planning	66.5	28.3	5.1	1,034
Business Administration and Related	47.0	42.2	10.2	14,664
education Science and Teacher Training	45.0	38.9	16.1	26,813
Engineering and Technology	56.5	35.9	7.7	9,500
Fine and Applied Arts	60.4	34.9	4.8	1,178
General	48.4	36.9	14.6	499
Home Economics	42.8	44.4	12.7	471
Humanities	43.1	42.3	14.5	9,225
IT-Related Disciplines	64.1	32.4	2.5	7,840
Law and Jurisprudence	80.2	15.7	3.6	3,139
Maritime	75.2	22.1	2.6	949
Mass Communication and Documentation	48.4	40.4	11.2	2,164
Mathematics	44.2	43.1	12.7	5,142
Medical and Allied	55.3	40.3	4.3	14,482
Natural Science	41.3	42.8	16.0	6,392
Other Disciplines	54.7	35.2	10.1	4,339
Religion and Theology	30.0	49.0	21.0	1,669
Service Trades	64.0	31.4	4.6	1,206
Social and Behavioral Sciences	42.2	41.5	16.3	7,997
Trade, Craft and Industrial	39.4	50.3	10.3	340
Not elsewhere classified	51.4	38.1	10.4	13,362
Average (resp. total)	50.5	38.7	11.5	134,478

Source: CHED Statistical Bulletin, 2013

6. Discussion

The state of the country's education system as described above raises the issue of the government's proper role in education. The expansionary policy of the past has created a giant school system of poor quality with a virtual absence of adequate centers for graduate instruction and research in the sciences, mathematics, and technology. Both economic theory and development experience amply show the social and private benefits education produces, and efficiency criteria call for the government to support categories of education that have social benefits or positive externalities, not those which mainly benefit the well-off and already-educated. Yet these concerns are hardly new and are indeed already contained in the 1986 Constitution, which mandates the state to provide equitable access to quality education and to develop a science and technology capability through advanced instruction and research.[9] By continuing to pursue an expansionary policy in education, the government blithely ignores both first principles and these constitutional directives and concerns. That much can be seen in the recently legislated laws on K-12 and the abolition of tuition in SUCs.

Republic Act 10533 or the Enhanced Basic education Act, passed in 2013 and known popularly as the "K-12 law", increases the duration of high school education and indirectly also college education by two years. Its immediate impact is to increase the required budgetary support from the national government and to impose an additional cost of education to families who wish to send their children to high school or to college. The additional two years entail a 50 percent rise at a minimum in the cost of high school or college education that families must bear. While tuition may be free in public high schools, families must still bear the out-of-pocket costs for two additional years. The opportunity cost of education also rises in terms of foregone incomes for younger people who may find market work or may help in household chores or own-account production. In light of such considerations, it becomes uncertain whether and how far the K-12 initiative will improve (or indeed worsen) rates of school participation, cohort survival, and graduation in a now-extended high school.

Even before the law's passage, it will be recalled, the high-school participation rate and cohort survival rates already posed a problem: 68.9 percent and 80.6 percent respectively in 2013 [Albert and David 2015:2-3]. The top reasons given for being out of high school are a "lack of personal interest" and "the high cost of education"—under a system where public tuition is already free. The real reasons behind such answers may lie either in parents assessing high opportunity costs to education of children who could otherwise work, or they may reflect issues with the child's ability, preparation, or motivation itself [Albert and David 2015:5].

[9] The relevant provisions are Article II, Sec. 17 defining state policy and Article XIV, Secs. 1 and 10, which respectively address access to quality education and support to science and technology.

In neither case, however, is the addition of more years of schooling per se is likely to resolve the issue. Without being accompanied by radical compensating measures, such as a marked improvement in the attractiveness and relevance of basic education itself, a family's cost-benefit calculus is more likely if anything to turn further against sending a child to school and completing high school with the addition of two more years, and a highly plausible outcome is a worsening instead of participation, survival, and completion rates.

It may be contended that such dire outcomes can be precluded, since the added years of schooling will be "new-and-improved" ones that promise to be up to quality standards and more relevant to practical needs of students and their families (e.g., the promise of non-academic tracks geared more towards application and employment). The irony of this defense is that the wherewithal to implement such drastic changes in quality and direction has been eroded precisely by a misdirected reform that spreads budgets even more thinly over the basic education system and gives some up to the tertiary system as well in the form of free college tuition.

From one perspective, Republic Act 10931, or the free tuition law, may seem to mitigate the implied cost penalty to families of the K-12 law by reducing the costs of a college education. This must be seen, however, in the context of a likely reduced pipeline of high school finishers owing to the additional years of high school. In particular, whether these measures by themselves will improve access of more poor people to college in a net sense (the ostensible purpose) is doubtful.

Meanwhile, what is not in doubt is the increased pressure on the national government budget to replace the income that SUCs lose from tuition and other fees that they used to collect. Where this replacement is incomplete, imperfect, or unresponsive, SUC facilities and services are bound to suffer. This is more important in the major SUCs that previously enjoyed a greater deal of flexibility and autonomy in the use of funds they collected.

A second likely consequence is a higher demand for entry into SUCs, although not all of them may increase their enrollment. The high-quality and more prestigious SUCs—like UP, Central Luzon State University, and Philippine Normal University—tend to limit their student body to a size they can provide with high quality instruction. But relatively small and lower-quality SUCs may be more willing to increase their enrollment. An increase in enrollment will then likely further erode their quality and widen quality differences across higher education institutions. That policy will also further crowd out the private sector in higher education.

Clearly, a rethinking of the role of government in education is needed. Government support for education must be selective and aimed at improving the quality of basic education and the quality of a critical number of HEIs. In lieu of subsidizing all SUCs, the government support is more properly directed at a select number that can develop into world-class universities for advanced instruction and research. The SUCs and private HEIs that already have COEs and Centers of

Development that could be the target of a government education development program. Support for science and technology capability becomes even more imperative at a time the country approaches upper middle-income status, when competitiveness shifts away from low-wage industries to more knowledge-based activities. The urgency of this shift is being realized by countries already feeling the pinch of technological competition: China in 2015 launched its "double first-class" project, aiming to develop 40 of its universities into world-class universities by 2020.[10] India's "institutions of eminence" initiative in turn aims to place 10 private and 10 public universities in the top 500 of global universities in a decade. In both cases, societies already encountering the challenge find that purposive selection for excellence, not blanket subsidies to foster mediocrity, is the way forward.

As for access, families and their children will always demand education for the monetary and non-monetary benefits they expect from it. The government need not finance that part of the investment that yields mostly private benefits. Rather than give all SUCs students full subsidy by abolishing tuition fees, the problem of affording access to qualified but poor students can be approached through a socialized means-tested fees scheme similar to that originally adopted by UP. Under that scheme, students were charged fees depending on their means, with indigents being fee-exempt and receiving grants in aid. Before it was steamrolled by the "free tuition" law, the judicious expansion of the socialized tuition fee scheme was the legislated United Student Financial Assistance System for Tertiary education program, which covered scholarships, grants, and loans applicable to public and private students alike. A full-cost but socialized tuition scheme would be more progressive and would also foster competition between SUCs and private HEIs, relieving the enrollment pressure on the former. Income derived from tuition may then support quality improvements in each SUC.

The role of the private sector in higher education cannot be gainsaid, and part of the wrong-headedness of the free-tuition law is that it undermines that role. Private HEIs perform the important task of meeting the private demand for skills and credentials. Because of this, public resources are freed to be devoted to advanced teaching and advanced research, whose longer-term value to society is higher, as well as to scholarships and grants to students in need.

Relieving resource constraints will allow schools at all levels to experiment with cost-effective strategies that can raise quality in schools at all levels. Many of these involve a greater use of information technology both in terms of equipment and software, e.g., computers, videos, "flipped" classes, and so. But a return to quality also means a focus on the basics and providing the most basic instructional and existential requirements to the most deprived and neglected public schools.

[10] China may already have reached that goal or is close to doing so by some criteria. There were seven Chinese universities in the top 250 and 38 in the top 800 of the *Times* ranking for 2017.

These include the production of good textbooks, retraining of teachers, institution of libraries and laboratories, provision of lavatories, safe drinking water, health facilities, and means of transport to serve the public school system.

Serious education reforms require a fundamental rethinking of the output of various types of education and the government's appropriate role in this sector. Only thus can the social and private benefits of education be maximized. There is little room for mistaken priorities and missed chances before the windows of available competitive opportunities close for individuals and society.

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