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Strengthening Institutions to Improve Public Expenditure Accountability

A Cost-Effectiveness Analysis of Two Secondary School Interventions: The Case of Pasig City Division School

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I. Introduction

Prior to the implementation of K+12, the Philippine Educational System had a 6-4-4 structure: six years of elementary or primary education (although some private schools require seven years), four years of higher school or secondary education, and another four years of higher or tertiary education for a degree program (except for some courses like medical sciences and engineering which require five or more years of schooling).

Higher education is divided into collegiate, master's and doctorate levels in various programs or disciplines. As of school year 2009-2010, there were about 1,791 colleges and universities in the Philippines.

The responsibility of administering, supervising, and regulating basic (elementary and secondary education) is vested in the Department of Education (DepEd), while higher education is the responsibility of the Commission on Higher Education (CHED). Post-secondary, technical-vocational is under the Technical Education and Skills Development Authority (TESDA), which is also in charge of skills orientation, training, and development of out-of-school youth and unemployed adults.

National Policy Framework in Education: The right to education is enshrined in Article XIV, Section 1, of the Philippine Constitution which says: "The state shall protect and promote the right of all citizens to quality education at all levels and shall take appropriate steps to make such education accessible to all."

It is an avowed policy of the state in pursuit of its key objectives of global competitiveness and poverty alleviation, and to bring about sustainable development for the benefit of present and future generations of Filipinos. The government is committed to the operationalization of the Global Program of Action for Sustainable Development (Agenda 21) which was adopted by the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, in 1992, of which the Philippines is a signatory.

Philippine Agenda (PA) 21 envisions a better quality of life for all through the development of a just, moral, creative, spiritual, economically vibrant, caring, diverse yet cohesive society characterized by appropriate productivity, participatory and democratic processes, and a life lived in harmony within the limits of the carrying capacity of nature and the integrity of creation.

PA 21 adheres to the principles of sustainable development: developing human potential; holistic science and appropriate technology; cultural, moral and spiritual sensitivity; self-determination; national sovereignty; gender sensitivity; peace, order and national unity; social justice; inter- and intra-generational and spatial equity; participatory democracy; institutional viability; viable, sound and broad-based economic development; a sustainable population; ecological soundness; bio-geographical equity and community-based resource management; and global cooperation.

Also, as stipulated in Republic Act 7722, and in line with the thrust of education for sustainable development, CHED adopted a project called Centers of Excellence (COEs).

This project aims to identify institutions of excellence in instruction, research, and extension. These institutions are supported by CHED to attain world-class levels. Through networking arrangements, identified COEs and Centers of Development (CODs) act as role models engaging in extension services in the national, regional, and local community in the form of technology transfer, development of industry linkages and shared research resources, and financial assistance from other higher educational institutions within their particular geographic and academic area.

COEs and CODs are provided technical and financial assistance for student scholarships, faculty development, library and laboratory upgrading, research and extension services, instructional materials, and networking. There are now 271 identified COEs/CODs in the different disciplines. Centers of Excellence and Centers of Development will continue to be developed, particularly in the priority clusters of disciplines which include information technology, science and mathematics, teacher education, and agriculture.

Policy Question: In attempting to achieve the stated policy of providing quality basic education equitably accessible to all, the Department of Education continuously provides program interventions to ensure appropriate delivery of educational services. The strategies developed by government education planners in its sectoral development plan of 2004-2010 indicated the following policy directions that correspond to specific program interventions and activities.

- Promote and maintain quality assurance in all levels of education¹
- Provide early childhood education
- Close the classroom gap
- Increase the access of economically and socially disadvantaged groups to education services
- Improve the quality of basic education
- Upgrade science, mathematics, and English in basic education
- Improve the contribution of teachers in learning outcomes
- Institutionalize a more focused values formation program in basic education
- Improve the relevance of secondary education
- Promote school- and area-based management
- Rationalize the budget for basic education
- Increase the access of economically and socially disadvantaged groups to education and training
- Improve competitiveness of middle-level skills development (MLSD)
- Broaden the access of economically and socially disadvantaged groups to education
- Expand alternative systems and alternative delivery modes for higher education
- Improve the quality of higher education institutions (HEIs), programs, and graduates to match the demands of domestic and global markets
- Rationalize governance and financing higher education in a manner that would unleash institutional creativity and entrepreneurship

Among these policy directions, upgrading the performance of students in science, mathematics, and English is included in this study. For the last six years, performance in these three subject areas has been dismal. The achievement rate in English decreased from a high of 53.46 percent in the school year (SY) 2007-08 to 46.95 percent in SY 2009-10. Similarly, performance in math and science decreased in the same years, from 42.85 percent and 46.71 percent in SY 2007-08, to 39.64 percent and 43.80 percent, respectively.

¹ UNESCO defines quality assurance as "the systematic review of educational programmes to ensure that acceptable standards of education, scholarship and infrastructure are being maintained." Available at <u>www.unesco.org/new/en/education/themes/strengthening-education-systems/higher-education/quality-assurance/</u>, accessed June 21, 2013.



Figure 1. Secondary Level National Achievement Rates in Math, Science, and English

The national government has instituted several innovations and reforms in the curriculum, testing and assessment, teacher development, school improvement, and alternative delivery modes to address the issue of improving performance in formal basic education. Among these are Curricular Reforms and Quality Improvement through Teacher Development Programs.ⁱ

The introduction of curricular reforms led to the Basic Education Curriculum at the elementary level and the Restructured Basic Education Curriculum at the secondary level. The subjects at both levels of basic education were reduced to five (i.e. math, science, English, Filipino and Araling Panlipunan) to facilitate lifelong learning skills. The implementation of the curriculum included training of teachers and administrators, development of modules and training materials, and close monitoring and assessment of program implementation.

Teacher development programs were also instituted to improve the quality of basic education. Teachers are considered the most important input to basic education; these were the major initiatives by the Department of Education in partnership with other basic education stakeholders: (1) teacher education and development program, (2) national English proficiency program, (3) project on strengthening the support system INSET institutionalization, and (4) increasing the number of teaching positions yearly.

For the purpose of analysis, this study will focus on the first initiative: the teacher education and development program. This is a combination of immediate and long-term policy reforms in teacher education. Its purpose is to advocate stronger formal partnership between the Commission on Higher Education (CHED)/teacher education institutions, and the Department of Education for the improvement of both pre-service and in-service teacher education, which includes training and scholarships for public school teachers.

Two programs/interventions are proposed for a cost-effectiveness analysis (CEA) in education: (1) scholarship for teachers to upgrade skills in English, math, and science, and (2) learning through a "discovery approach". These programs are deemed relevant and important to create and nurture an academic environment that is aimed at improving quality, equity, and efficiency of secondary education in the Philippines.

The first program, scholarship for teachers, seeks to upgrade the academic qualifications of secondary faculty in all regions and up to the Master's levels. Its primary aim is to enhance teacher skills in English, math, and science. While this program is limited for a few teachers per region per year, the optimal benefit can be reflected in transforming qualified and deserving teachers into

individuals well-equipped with the necessary tools to support the government's drive to give the highest priority to the adoption of measures for the total eradication of illiteracy.

The challenge for the national government is to introduce policy reforms that will take the program to a wider population across all regions in the Philippines, and to a greater number of teacher-scholar beneficiaries.

The second program, learning through a discovery approach, is intended to contribute to raising the standards of pupil learning in secondary schools through the introduction of an enhancement instruction tool called Strategic Intervention Materials (SIM). The use of this tool is the prerogative of certain Division Schools because education in the Philippines is decentralized. However, it could be effective in fostering creativity and innovativeness in generating new theories and concepts for learning in classrooms.

Significance of The Study: Clearly, achieving the goal of quality education and opportunities for the youth would entail program interventions in each item on the education policy agenda. It will be costly and huge resources are needed to achieve them. A cost-effectiveness evaluation of program interventions provides a method of comparing alternatives for their relative costs and results, and providing guidelines for which of the alternatives has the best impact relative to costs.ⁱⁱ

Gaps in information as to which program alternative is most cost-effective is a familiar dilemma in the education sector. Policy-makers therefore need to be apprised of such information and are needed to be guided accordingly.

It has been seen that both programs are potentially of interest to policy-makers as they will yield results (i.e. improved performance/test scores of students) that can directly measure the impact and cost-effectiveness of interventions at the local and national levels. Results of the study will also interest program implementers in the Pasig City School Division and other school districts for guided decision-making in program choice and possible replication.

Assessing the importance and cost-effectiveness of these interventions brings us to the issue of sustainable economic growth. The stability and growth of the Philippine economy is highly dependent on its ability to produce goods and services for both domestic and international use. As a vital factor of production, the improvement of the quality of the labor force and efforts to make it more productive and responsive to growth are necessary for the country's economic well-being.

The advent of globalization and rapid technological change has made new demands on the Philippine labor market, especially in education. Planners and policy-makers in higher education have recognized that new breeds of competitors are providing an array of products and services, and in some cases, substitute products and services. This poses a tremendous challenge to the Filipino workforce to be competitive in the global market, and to the Philippine government to direct its efforts to providing an environment characterized by stronger labor market intelligence and technology development. This certainly calls for specific policy reforms in education aimed at transforming the Filipino workforce into a knowledge-based force, adaptable to shifting skills and jobs, both in the domestic and international markets.

II. Review of Related Literature

A general web search reveals an abundance of related literature on cost-effectiveness analysis. For example, a single source—the US Education Resources Information Center (ERIC)—has a surfeit of literature that dates back to the 1970s. This type of economic evaluation is increasingly being used to identify different levels of education and interventions.

However, despite the rich search results, one common observation is that they are of poor quality, make mostly rhetorical claims and with limited data and many of which have rhetorical references only on cost-effectiveness claims with substantial attempts and limited data.

In a survey of cost-effectiveness of education policies in Latin America, experts stated that knowledge about cost-effectiveness in education is inadequate. According to them, the problem is that measuring the cost-effectiveness of educational interventions is difficult, time-consuming, and costly, requiring sophisticated research instruments. Only a small number of CEA studies on education have been completed in developing nations, often not taken into account in educational reforms.ⁱⁱⁱ

Levin (2001), a prolific writer and a leading proponent of CEA in education, presents possible explanations for the relative dearth of cost analysis in education and the poor quality of material that does exist. The first is the lack of capacity and training. Only a few evaluators have the training to undertake competent cost-effectiveness evaluation, training programs, and textbooks for reference. Second is the lack of reliable effectiveness results. Cost analyses need good estimates of effects. The last factor is the lack of demand for such analysis by policy-makers.^{iv}

Specific to program interventions, recurrent CEA studies are mostly in the areas of information, communication and technology (ICT) learning, and distance education interventions. On curriculum development and teacher scholarship, a notable work is that by Levin (1984) which includes instructional interventions such as peer and adult tutoring, computer-assisted instruction, increased duration of the school day, and reduction of class size. An outcome or effectiveness measure is targeted at improved performance in mathematics and reading among elementary school children.

The objective of Levin's study is to provide a cost-effectiveness evaluation of the four educational interventions for improving reading and mathematics proficiency. Using the tools of meta-analysis (synthesizing statistical analysis of summary findings of many studies) and cost-effectiveness, each intervention is evaluated and compared according to its cost-effectiveness in improving reading and mathematics scores. Cost-effectiveness results show that the tutoring approach is the most cost-effective, while reducing class size and increasing the duration of school days are found to be the least cost-effective. Ranking between these is computer-assisted instruction (see Table 1 for C-E ratio).^v

| (Average of mathematics and reading effect sizes for every \$100 spent per student per subject) | | | | | | | | |
|---|---------------------------------|-----------|--|--|--|--|--|--|
| Intervention | Attributes | C-E Ratio | | | | | | |
| Cross-age tutoring | Combined peer and adult program | .22 | | | | | | |
| | Peer component | .34 | | | | | | |
| | Adult component | .07 | | | | | | |
| Computer-assisted instruction | | .15 | | | | | | |
| Class size reduction | From 35 to 30 | .11 | | | | | | |
| | 30 to 25 | .09 | | | | | | |
| | 25 to 20 | .08 | | | | | | |
| | 35 to 20 | .09 | | | | | | |
| Increased instructional time | | .09 | | | | | | |

Table 1. Average C-E ratios of Four Interventions for Two Subjects

Increased instructional tir

Source: H. Levin (1984).

There is a dearth of literature on cost-effectiveness analysis in education in the Philippines as this analysis has mostly been done for health program interventions. While some CEA studies in education may have been completed or are on-going, the lack of documentation reflects inadequate research dissemination. Providentially, foreign developmental institutions such as Global Development Network (GDN) provide opportunities to strengthen local research institutions in the understanding and application of this tool of analysis in policy-making.

III. PROGRAM Interventions

From a government listing of program interventions on education at the national and local levels, the Center for Research and Communication identified two interventions that would address a common outcome: an upgrade in student proficiency in science, mathematics, and English at the secondary level of schooling.

Several criteria were used in choosing the two interventions for the cost-effectiveness analysis: (1) the interventions must be designed for improving proficiency in the three subjects, (2) they had to be implemented in the same area, in this case the Pasig City Division School; (3) they had to be implemented in the same period; (4) must have the potential for replicability, or are currently being replicated in other areas; and (5) data retrieval is sufficient for an acceptable evaluation.

A. Scholarship of Public School Secondary Teachers in the Pasig City School Division

The objective of the program, as already stated, is to upgrade the level of proficiency of students at the secondary level in three subjects: math, science, and English. The Pasig City School Division encouraged teachers to avail of the government' scholarship programs and sponsorships from private entities. Eight teachers were awarded scholarships in the division and completed their Master's degrees in the three subjects. They taught in five public schools in Pasig City.

| Group 1: Schools with Teachers who Received Scholarships | |
|--|--|
| Rizal High School | |
| Sagad High School | |
| Kapitolyo High School | |
| Eusebio High School | |
| Manggahan High School | |

The Department of Education (DepEd) offers scholarships in every region of the Philippines. Applicants need to pass the DepEd's qualifying exams as well as the College Entrance Exams of the university/school of choice. After availing of the scholarship grant, teachers are required to render two years of public service.

Scholars take a leave of absence for 12 to 16 months, depending on the scholarship program or course work requirements. They are encouraged to take their courses at universities that are designated as Centers of Excellence. These Centers have the responsibility of improving and enhancing the quality of education in the Philippines. Given this mandate, the Centers of Excellence exemplify the following standards:

- highly educated, professionally qualified and experienced faculty dedicated to the philosophy, mission, vision, and goals of the institution and to education;
- well-established students;
- adequate library, research, and study facilities;
- competent administrative and support staff;
- well-planned and relevant instructional programs;
- adequate student development programs;
- adequate student services;
- relevant extension service and outreach programs;
- good percentage of graduates who become teachers; and
- such other criteria as may be established and functionally determined by the Teacher Education Council.

In this report, the Centers of Excellence chosen by the selected teacher-scholars to pursue Master's programs in upgrading their teaching skills in the three subjects are: the University of the Philippines, Diliman, for Language Courses, Master of Arts in English (public school); Ateneo de Manila University for Master of Arts in Mathematics (private school); and De La Salle University for Master of Arts in Chemistry (also a private school). Tuition costs vary by school.

B. The Strategic Intervention Materials (SIM) Learning Enhancement Module

According to DepEd, there is a prescribed curriculum in place for each subject. However, the Department accepts suggestions for enhancement of the prescribed curriculum, as long as implementation is with its approval.

The levels of enhancement are categorized into the following:

- Enhancement and instructions are integrated in class.
- Enhancement is done outside of the classroom (e.g. remedial classes).
- Enhancement is done through the discovery approach.

This study will therefore focus on the third category (discovery approach) through the Strategic Intervention Materials (SIM) piloted at the Pasig City School Division. The objective of the SIM intervention is to assist the class or group/s of students who have difficulty in any of the subjects. SIMs are conducted during class and are normally integrated with the lesson plan for each day.

A typical SIM outline follows this sequence of instruction that serves as a guide to teachers' instructions:

- 1. Overview of the lesson
- 2. Presentation on the focus skill/s
- 3. Introduction of activities
- 4. Engagement of learner's interest, and
- 5. Assessing the learners' performance of the task/s

The following are the schools using the SIM intervention as a tool to improve the proficiency of secondary students in the three subjects:

| Group 2: Schools Adopting the SIM Intervention |
|--|
| Pinagbuhatan High School |
| Santolan High School |
| Sta. Lucia High School |
| San Joaquin-Kalawaan High School |
| Nagpayong High School |

IV. Description of Cost Data

A. Strategic Intervention Materials (SIM) Learning Enhancement Module

This intervention operates mainly on the initiative and ingenuity of teachers adopting the materials. It entails the use of a smaller or greater number of resources based on the design of the materials. In the interviews conducted with teachers using SIM, many recognized the deficiencies in the budgetary system and shortage of supplies in their respective schools and the City Division itself. Under these circumstances, they are obliged to personally finance the SIM materials required.

The identification and specification of requirements is done through a classification of items in major categories in the budget: (1) development of learning materials, (2) personnel, (3) administrative support, and (4) institutional support.

Cost estimates were derived from interviews with teachers and division officers and authors' estimations with prevailing rates and prices of materials to this writing.

Development of Learning Materials: These include all instructional materials, referred to here as SIM or Strategic Intervention Materials, used to present and discuss the subject concerned, whether the expenses in their procurement are covered by the School Division, and whether the teachers are employing the intervention materials themselves, or those donated by other individuals or groups. Specifically, these learning materials would include paper, ink and printing costs, acetate, CDs and data burn, ring-binders, together with internet research and email costs.

The specific materials solely allocated to the intervention, as also those that are shared with other activities are included in this category.

Personnel: These costs are all the human resources required for the development of learning materials. This category includes full-time teachers of the Pasig City School Division and education supervisors. These personnel (teachers) have qualifications to teach (English, math, science, or a combination of them), ranks (e.g. Master Teacher), and time commitments. It is assumed that there

are 80 teachers in the first year that the SIM was introduced and 100 teachers in the second year. Interestingly, the personnel included in the SIM preparation are also engaged in other roles at the Pasig City Division School such as administration, coordination, teaching, teachers' training, and curriculum design.

Qualification refers to the training, experience, and specialized skills of the teachers producing the SIM or intervention materials. Time inputs or man-days refer to the amount of time that each teacher devoted to the production of intervention materials.

Administrative Support: This includes all expenditures pertaining to production of the intervention materials. The bulk of these cost items was cornered by the administrative personnel lending support to the teachers in all aspects of printing and packaging the final material. Meetings and representation is another high-cost item, together with office rentals, printing and stationery expenditures, and utilities such as electricity and water supply.

Institutional Support: This includes costs related to depreciation and amortization on the institution's fixed assets that support the production of the intervention materials (i.e. Pasig City Division of City Schools). These are computers, fax machines, printers, and telephones.

The total cost for the SIM Program is PHP 3,260,114.74. (See Annex 2 for complete details.)

B. Scholarships for Public School Secondary Teachers

Program Costs: These are tuition fees, living allowances, dormitory, book allowance, research allowance, and other miscellaneous items. Tuition fees vary according to the school attended by the teacher-scholar. Living allowance includes provisions for transportation, meals, and documentation. (See Annex 1.)

Personnel: This expenditure covers salaries of the scholar-teachers, averaging PHP 15,000 a month for eight recipients of scholarship. It is assumed that the duration of their respective programs is two years. Total personnel cost of the program is PHP 2,460,000.00.

Administrative and Institutional Support: Even though scholar-teachers are officially on leave-ofabsence, the School Division supports their training and shoulders the cost of substitute teachers. This category also includes all cost items related to depreciation and amortization on fixed assets of the institution.

The total cost of the teacher-scholarship program is PHP 5,450,760.92. (See Annex 2 for complete details.)

V. Methodology of Cost Estimation

Our researchers were able to simulate the costs for each program intervention through key informant interviews, secondary data review, and focus group discussions. These were validated through subsequent consultations with key officers of the Pasig City School Division.

Cost data were derived from scholarship contracts presented by selected teacher-scholars. Cost assumptions were based on program requirements as to the number and cost per academic unit, courses to be taken, and number of terms for completion of the program.

For the SIM material too, estimated cost data were based on interviews with teachers adopting the materials for a specific program cycle. The estimated costs for producing the SIM material was presented to the teachers using SIM. It was proximate to the actual costs since the program has not really been accounted for in the Pasig City School Division. The same is true for the scholarship program for public school secondary teachers in the same division.

Certain issues therefore arise in the evaluation of programs in the education sector. One, specific programs such as scholarship for teachers and the development of SIM materials are not accounted for in the actual expenditures, but are nevertheless a part of special programs. Two, there is no tool or instrument to monitor and evaluate the performance of such programs for teacher development, apart from documentation through model SIM materials and examples of actual conduct.

VI. Description of Effectiveness Data

For the purpose of this study, the effectiveness data is the Achievement Rate of students at the secondary level of basic education in the three subject areas. The Achievement Rate is arrived at through the results of the National Achievement Test (NAT).

The National Achievement Test is facilitated yearly by the National Educational Testing and Research Center (NETRC) under the Department of Education. The NETRC provides information vital to the formulation of educational policies. The test is given at the two levels of basic education: the National Elementary Achievement Test and the National Secondary Achievement Test.

NAT at the secondary level aims to assess the abilities and skills of students to determine their knowledge and capabilities in five subject areas: English, Filipino, science, math, and social studies (Araling Panlipunan).

The NAT results are intended to guide the Department of Education in its efforts towards improvement of the quality of education in public schools and to provide appropriate interventions for the students. A score of 75 percent and more indicates a student's mastery over the subject, between 50 and 75 percent is close to mastering the subject; and a score below 50 percent indicates a low degree of mastery.

From the school year 2002-2003, the test was given to grade 3, grade 6, and 2nd-year high school students. From 2004 to 2006, NAT was also given to high school students as a special measure to further aid in the assessment of school performance.

The 176 school divisions nationwide are in charge of facilitating NAT among all schools on the assigned date set by the education department. For the purpose of this study, the selected division where NAT scores were obtained is the Pasig City School Division in Metro Manila.

There are 10 public secondary schools in Pasig City that submitted their NAT mean scores to the Pasig City School Division, disaggregated by quarters for the school years 2007-2008; 2008-2009; and 2009-2010.

The NAT test scores are recorded in tally sheets per class of teachers in a given academic year. These class tally sheets are submitted to the Pasig City School Division at the end of each academic year.

VII. Methodology of Effectiveness Estimation

Through key informant interviews with Education Supervisors of each of the three subjects (math, science, and English), and consultation meetings with teachers adopting the SIM intervention and teacher-scholars, we established two groups from among the 10 schools: those in which most teachers adopted the SIM intervention, and those in which teachers were scholarship recipients.

| Group 1: Schools with teachers who | Group 2: Schools adopting SIM | | | |
|------------------------------------|----------------------------------|--|--|--|
| received scholarship | intervention | | | |
| Rizal High School | Pinagbuhatan High School | | | |
| Sagad High School | Santolan High School | | | |
| Kapitolyo High School | Sta. Lucia High School | | | |
| Eusebio High School | San Joaquin-Kalawaan High School | | | |
| Manggahan High School | Nagpayong High School | | | |

Based on the submitted NAT mean scores of each school for the school years 2007-2008; 2008-2009; and 2009-2010, average mean scores were calculated for each program group. This yielded the following averages:

| | | | English | Math | | | Science | | | |
|-----------------------------|--|---------|---------|-------|-------|-------|---------|-------|---------|-------|
| | | 07-08 | 08-09 | 09-10 | 07-08 | 08-09 | 09-10 | 07-08 | 08-09 | 09-10 |
| Schools w/ Scholar Teachers | | 29.66 | 28.13 | 29.67 | 28.17 | 28.11 | 23.99 | 30.59 | 30.13 | 30.86 |
| | | | | | | | | | | |
| | | English | | | Math | | | 5 | Science | |
| | 07-08 | 08-09 | 09-10 | 07-08 | 08-09 | 09- | 10 0 | 7-08 | 08-09 | 09-10 |
| Schools with SIM | 27.71 | 29.11 | 28.76 | 25.14 | 22.8 | 32 22 | .48 2 | 28.66 | 28.31 | 28.95 |
| *NAT for the second | *NAT for the secondary level was given to 2^{nd} year high school students for all the years indicated | | | | | | | | | |

TNAT for the secondary level was given to 2^{m} year high school students for all the years indicated.

The same effectiveness measure is calculated for both programs:

| Effectiveness Measure |
|---|
| B – A = Annual increase of the mean scores of students in the 3 subject |
| areas |

However, there were impediments to establishing causality. Much as we would like equity in both groups of schools, several intervening variables arise.

School facilities and materials play a significant role in the quality of learning among students. Where there are appropriate facilities such as visual aids and computer-assisted instruction, learning is better facilitated.

Class size also varies across schools. Rizal High School has the highest student population among the schools in Pasig City. The socio-economic status of students is also a factor to consider.

To rule out these threats to internal validity, it is ideal to adopt an experimental evaluation design. However, due to practical constraints, researchers opted for this assumption which forms part of the study's limitations.

VII. Cost-Effectiveness Ratio

The cost-effectiveness ratio indicates that SIM is the more cost-effective program intervention to improve proficiency in English among secondary level public school students in Pasig City. This means that for every 1.41 annual increase in mean scores of students in English, the government spends PHP 770.712.70. This is comparatively lower than the teacher'scholarship CE ratio of more than a million Pesos spent by the government.

| | | | English | |
|--------------------------|------------------------|--------------------------------------|---------|-------------------|
| Program | Total Cost (in PHP) | Cost per subject area (in PHP) | Effect | Ratio (in PHP) |
| Teachers' Scholarship | 5,450,760.92 | 1,816,920.31 | 1.54 | 1,179,818.38 |
| SIM | 3,260,114.74 | 1,086,704.91 | 1.41 | 770,712.70 |

The same is true for Science. The CE ratio indicates that the more cost-effective program intervention towards improving proficiency in science among secondary level public school students in Pasig City is the Strategic Intervention Material. That is, for every 0.64 annual increase in mean scores of students in science, the government spends PHP 1,697,976.43, an amount comparatively lower than the teachers' scholarship CE ratio of more than two million Pesos spent by the government.

| | | Science | | | | | |
|--------------------------|------------------------|--------------------------------------|--------|-------------------|--|--|--|
| Program | Total Cost (in PHP) | Cost per subject area (in PHP) | Effect | Ratio (in PHP) | | | |
| Teachers' Scholarship | 5,450,760.92 | 1,816,920.31 | 0.72 | 2,523,500.43 | | | |
| SIM | 3,260,114.74 | 1,086,704.91 | 0.64 | 1,697,976.43 | | | |

In math, however, no effect was calculated for both intervention programs. It is recommended that alternative interventions be considered in improving proficiency in the subject.

VIII. Conclusion and Recommendations

Two program interventions to achieve the goal of quality secondary education in the Philippines have illustrated comparisons in implementation cost and the achievement of intended result or impact. Based on the results of cost effectiveness ratio on both options, the research team has confirmed that the Strategic Intervention Material is the more effective alternative towards improving proficiency in English and Science among secondary level public school students in Pasig

City compared to scholarship for teachers' training. However, no effect was calculated in both interventions for improving proficiency in Math subject.

The research team recommends the comparison of other learning interventions in the use of CEA and to look at other multiple effects of each intervention, such as improvement of teaching skills among teacher-scholars. In doing so, we are able to expand the usefulness of CEA and benchmark programs in education can be identified.

ⁱ Philippine Education For All 2015: Implementation and Challenge.

^{II} H. Levin. 2001. Waiting for Godot: Cost-Effectiveness Analysis in Education, p. 56. (PUB DETAILS?)

^{III} E. Schiefelbein, et al. 1999. *Cost Effectiveness of Education Policies in Latin America: A Survey of Expert Opinion*. Bulletin 49, August. UNESCO/OREALC, 53-76, Washington D.C.

^{iv} H. Levin. 2001 "Waiting for Godot: Cost-Effectiveness Analysis in Education", in *New Directions for Evaluation*, No. 90. Jossey Bass Publishers. (CHECK WITH REF 2)

^v H. Levin. 1984. *Cost-Effectiveness of Four Educational Interventions*. Stanford University Institute for Research on Educational Finance and Governance, California.

| | | | CENTERS C | DF EXCELL | ENCE | | | | | | |
|---|--------------------------------------|-------|-------------|--------------|---------|---------------|-----------|-------|--|--|--|
| DEPARTMENT OF EDUCATION SCHOLARSHIP GRANTS | | | | | | | | | | | |
| (From Public and Private scholarship donors to DepEd) | | | | | | | | | | | |
| Public | с | | Private | | | | | | | | |
| UNIVERSITY OF THE | e P hilip | PINES | Ateneo de M | Ianila Uni | VERSITY | DE LA SALLE | UNIVERSI | ТҮ | | | |
| Language Co | ourses | ; | MA in M | 1athemat | tics | MA in Ch | nemistry | | | | |
| MA in Eng | glish | | | | | | | | | | |
| Estimated Cost | t per Te | erm | Estimated | Cost per | Term | Estimated Co | ost per T | erm | | | |
| Tuition (per P | Php | Php | Tuition | Php | Php | Tuition (per | Php | Php | | | |
| unit x 36 1 | L,000 | 36,00 | (per | 18,00 | 54,00 | unit x 36 | 1,000 | 36,00 | | | |
| units x | 36 | 0 | term) | 0 x 3 | 0 | units | x 36 | 0 | | | |
| excluding u | units | | | terms | | excluding | units | | | | |
| miscellaneou | | | | miscellaneou | | | | | | | |
| s fee) | | | | s fee) | | | | | | | |
| Living P | Php | Php | Living | Php | Php | Living | Php | Php | | | |
| Allowance 5 | ance 5,000 70,00 Allowanc 5,000 70,0 | | 70,00 | Allowance | 4,000 | 56,00 | | | | | |
| x | (14 | 0 | е | e x 14 0 | | | x 14 | 0 | | | |
| n | nos. | | | mos. | | | mos. | | | | |
| Book P | Php | Php | Book | | Php | Book | Php | Php | | | |
| Allowance 4 | 1,000 | 12,00 | Allowanc | | 10,00 | Allowance | 2,500 | 7,500 | | | |
| x | (3 | 0 | е | | 0 | | x 3 | | | | |
| te | erm | | | | | | term | | | | |
| S | 5 | | | | | | s | | | | |
| Research P | Php | Php | Research | | | Research | | | | | |
| Allowance 5 | 5,000 | 15,00 | Allowanc | | | Allowance | | | | | |
| x | (3 | 0 | е | | | | | | | | |
| te | erm | | | | | | | | | | |
| S | 5 | | | | | | | | | | |
| Dormitory (if P | Php | Php | Dormitor | | | Dormitory (if | Php | Php | | | |
| any) 4 | 450 x | 6,300 | y (if any) | | | any) | 3,500 | 49,00 | | | |
| 1 | L4 | | | | | | x 14 | 0 | | | |
| n | mos. mos | | | | mos. | | | | | | |
| Total P | 1hn 17 | 0 200 | Tatal | Dhn 12/ | | Tatal | Dhm 14 | | | | |

Annex 1. Assumptions of Costs Data for Scholarship Program

Note: Costs are based on interviews with teacher-scholars and are subject to change upon validation of data. Source: Focus Group Discussion with Pasig City Public High School Teachers who received Department of Education Scholarship Grants for Masters in Education, Majors in Math, Science and English, 16 September 2010, Pasig City Division Schools Head Office.

| Curriculum Development Cost Estimates | | | | | | |
|---|-------|-------------|-----------|--------------|--------------|--------------|
| Budget line | Notes | Unit | Unit cost | Cost in PhP | Cost in PhP | Total |
| | | (frequency) | in PhP | Year 1 | Year 2 | expenditure |
| | | | | | | 2 years |
| 1.PROGRAM COSTS | | | | | - | - |
| 1.1 Development of Learning Materials | 1a | set | | | | |
| Paper | | ream | 200.00 | 16,000.00 | 20,000.00 | 36,000.00 |
| Ink and printing costs | | cartridge | 500.00 | 40,000.00 | 50,000.00 | 90,000.00 |
| Acetate | | pc. | 6.00 | 480.00 | 600.00 | 1,080.00 |
| CD and data burn | | CD | 12.00 | 960.00 | 1,200.00 | 2,160.00 |
| Ringbind | | job order | 30.00 | 2,400.00 | 3,000.00 | 5,400.00 |
| Internet research and e-mail costs | | hourly | 560.00 | 44,800.00 | 56,000.00 | 100,800.00 |
| Workshops | | 2 per year | - | - | - | - |
| Sub total | | | | 104,640.00 | 130,800.00 | 235,440.00 |
| | | | | | | |
| ZA. PERSONNEL | | 1.1 | | | | |
| Teachers | 2a | days | 909.10 | 1,018,192.00 | 1,272,740.00 | 2,290,932.00 |
| Education Supervisors (8 learning areas) | 2b | 1 man day | 1,136.36 | 9,090.91 | 9,090.91 | 18,181.82 |
| Sub total (2A) | | | | 1,027,282.91 | 1,281,830.91 | 2,309,113.82 |
| | | | | | - | - |
| 3. ADMINISTRATIVE COSTS | | | | | - | - |
| Dank charges | | بالطعم مع | | | | - |
| Board meetings | | auartariu | | | | |
| Computer expenses | | | | | | |
| Legal fees | | annually | | | | |
| | | unnuuny | | | | |
| Electricity, water & rates | | monthly | 1,055.93 | 12,671.16 | 12,671.16 | 25,342.32 |
| | | 6/12 | | | | |
| Freight and postage | | months | | | | |
| Insurance | | annually | | | | |
| Internet & a mail casts | | monthly | 202.07 | 1 607 64 | 1 607 64 | 0 315 39 |
| Medical aid | | monthly | 202.97 | 4,007.04 | 4,007.04 | 9,215.28 |
| | | monuny | | - | - | - |

| Motor vehicle fuel | monthly | | - | - | - |
|--|-----------|-----------|---------------------|---------------------|---------------------|
| Motor vehicle expenses | quarterly | | - | - | - |
| Recruitment costs | | | - | - | - |
| Rentals (office) | monthly | 3.065.43 | 36.785.16 | 36.785.16 | 73.570.32 |
| Security | monthly | | - | - | - |
| Talanhana casta | monthly | 292.07 | 4 607 64 | 4 607 64 | 0.215.29 |
| | monthly | 383.97 | 4,607.64 | 4,607.64 | 9,215.28 |
| Administrative staff support | monthly | 13,482.12 | 161,785.44 | 161,785.44 | 323,570.88 |
| Printing and stationery costs | monthly | 1,379.20 | 16,550.40 | 16,550.40 | 33,100.80 |
| Meetings and Representation | monthly | 6,711.71 | 80,540.52 | 80,540.52 | 161,081.04 |
| Sundry | monthly | | | | - |
| Sub total | | | 317,547.96 | 317,547.96 | 635,095.92 |
| | | | | | |
| 4. INSTITUTIONAL SUPPORT | | | | | |
| Depreciation & amortization on fixed assets | annually | 40,232.50 | 40,232.50 | 40,232.50 | 80,465.00 |
| Sub total | | | 40,232.50 | 40,232.50 | 80,465.00 |
| Sub total (3+4) | | - | 357,780.46 | 357,780.46 | 715,560.92 |
| | | | | - | - |
| GRAND TOTAL | | | <u>1,489,703.37</u> | <u>1,770,411.37</u> | <u>3,260,114.74</u> |
| Notes: 1a. 1 SIM learning material per | · | | · | · | · |

teacher

2a. Assumption is 80 teachers for the first year and 100 teachers for the second year for entire Pasig City Division School

| Scholarship Program Cost Estimates | | | | | | |
|---------------------------------------|-------|-----------------|-----------|--------------|--------------|--------------|
| Budget line | Notes | Unit | Unit cost | Cost in PhP | Cost in PhP | Total |
| | | (frequency) | in PhP | Year 1 | Year 2 | expenditure |
| | | (- 1 | | | | 2 years |
| 1.PROGRAM COSTS | | | | | - | - |
| Tuition | 1a | per term/sem | 42,000.00 | 336,000.00 | 336,000.00 | 672,000.00 |
| Living Allowance | 1b | monthly | 4,500.00 | 360,000.00 | 360,000.00 | 720,000.00 |
| Book Allowance | | per term/sem | 3,800.00 | 121,600.00 | 121,600.00 | 243,200.00 |
| Research Allowance | | per term/sem | 5,000.00 | 160,000.00 | 160,000.00 | 320,000.00 |
| Dormitory | | monthly | 2,000.00 | 160,000.00 | 160,000.00 | 320,000.00 |
| Workshops | | 2 per year | - | - | - | - |
| Sub total | | | | 1,137,600.00 | 1,137,600.00 | 2,275,200.00 |
| 2.PERSONNEL | | | | | | |
| Scholar-teacher's salary | 2a | monthly | 15,000.00 | 1,200,000.00 | 1,260,000.00 | 2,460,000.00 |
| Sub total | | | | 1,200,000.00 | 1,260,000.00 | 2,460,000.00 |
| | | | | | - | - |
| 3. ADMINISTRATIVE COSTS | | | | | - | - |
| | | | | | | - |
| Bank charges | | monthly | | | | |
| Board meetings | | quarterly | | | | |
| Computer expenses | | annually | | | | |
| Legal fees | | annually | | | | |
| Electricity, water & rates | | monthly | 1.055.93 | 12.671.16 | 12.671.16 | 25.342.32 |
| | | 6/12 | _, | | | |
| Freight and postage | | months | | | | |
| Insurance | | annually | | | | |
| | | | | | | |
| Internet & e-mail costs | | monthly | 383.97 | 4,607.64 | 4,607.64 | 9,215.28 |
| Medical aid | | monthly | | - | - | - |
| Motor vehicle fuel | | monthly | | - | - | - |
| Motor vehicle expenses | | quarterly | | - | - | - |
| Recruitment costs | | | | - | - | - |
| Rentals (office) | | monthly | 3,065.43 | 36,785.16 | 36,785.16 | 73,570.32 |
| Security | | monthly | | - | - | - |

| Telephone costs | monthly | 383.97 | 4,607.64 | 4,607.64 | 9,215.28 |
|--|-----------------------|-----------------|----------------------|----------------------|---------------------|
| Administrative staff support | monthly | 13,482.12 | 161,785.44 | 161,785.44 | 323,570.88 |
| Printing and stationery costs | monthly | 1,379.20 | 16,550.40 | 16,550.40 | 33,100.80 |
| Meetings and Representation | monthly | 6,711.71 | 80,540.52 | 80,540.52 | 161,081.04 |
| Sundry | monthly | | | | - |
| Sub total | | | 317,547.96 | 317,547.96 | 635,095.92 |
| 4. INSTITUTIONAL SUPPORT | | | | | |
| Depreciation & amortization on fixed assets | annually | 40,232.50 | 40,232.50 | 40,232.50 | 80,465.00 |
| Sub total | | | 40,232.50 | 40,232.50 | 80,465.00 |
| Sub total (3+4) | | - | 357,780.46 | 357,780.46 | 715,560.92 |
| | | | | - | - |
| GRAND TOTAL | | | <u>2,695,380.46</u> | <u>2,755,380.46</u> | <u>5,450,760.92</u> |
| Notes: | | | | | |
| 1a. Eight teachers are awarded scholarship | for Masteral degre | es as of consul | tation visit in Pasi | g City Division Scho | ool |
| 1b. 10 months per academic year (June - N | larch) | | | | |
| 2.a Teachers receive their full salaries durir | ng official leaves on | teaching for sc | cholarships | | |