

FINAL REPORT

**Search for INOVATIVE PRACTICES in
MANAGING LARGE CLASSES**

Submitted to the

**Science Education Institute
Department of Science and Technology**

By the

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September 2012

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Chapter 1

Introduction

Background and Rationale

Results of national assessments show that “the performance of Filipino student in science and math has been improving through the years, but the 75% criterion on level suggesting mastery has not been achieved” (DepEd-NETRC, 2006-2009). A number of reasons have been cited to explain this situation: shortage of teachers, lack of equipment and facilities, lack of instructional materials, and large class sizes mainly due to the influx of students following the *Programang Pantawid Pampamilyang Pilipino* (4Ps).

Given the rapid population growth in the Philippines and the initiatives for universal education (USAID, 2007), it is common to see many urban and even semi-urban schools with more than 70 students in one section. Studies including those from UP NISMED reveal that many science and math teachers feel inadequate to handle large classes because of their inability to engage students in inquiry-based lessons and assessment. They also find it difficult to address students’ needs and help those with behaviour problems. In turn students feel unimportant because the teacher does not guide their learning.

Objectives of the Search

In an attempt to address some, if not all problems related to large classes, the Science Education Institute of the Department of Science and Technology launched in February 2011 the nationwide *Search for Innovative Practices in Managing Large Classes*. In this Project, a large class is one with 51 to 70 students per section and an extra large class is one with more than 70 students.

The search aimed to document innovative practices in managing; large classes to improve the quality of teaching and learning science and math in public and private high schools with class sizes of more than 50 students.

Specifically, the Search seeks to inspire teachers in applying innovative practices in handling large and extra large classes, sustain school-community support in managing efficiently and effectively varied digital and non-digital learning resource environment in teaching science and math, and share collaboratively with the school and community the use of these best practices.

The Project was launched in February 2011 and the awarding of winners was done in September 2012. See Annex 1 for the Project brochure and schedule of implementation.

Chapter 2

The Search Process and Data Gathering Instruments

Thirty-four schools (See Annex X) submitted project proposals that ‘model innovative practices in the management of large and extra large classes in high schools that would lead to effective teaching and learning’. These proposals were screened by the Steering Committee based on a criteria developed by the Technical Working Group organized for this project, the members of which come from the Department of Education, National Institute for Science and Mathematics Education, Philippine Normal University, teacher organizations such as the Phi Lambda Theta and National Organization of Teachers and Educators (MetroBank Teacher Awardees), and SEI-DOST. The criteria for evaluating proposals included: *innovativeness, doability and replicability, sustainability and impact, and resource utilization and cost effectiveness.*

Six schools (four large and two extra large classes) qualified as finalists based on the description of the innovation and budget utilization plan. Table 1 in Chapter 3, gives the list of qualified schools, their category in terms of class size, and the subject area where the innovation was piloted.

One hundred thousand pesos (100K) were released to each of the six schools so that they could develop or buy materials for the proposed innovation. The Team Leader and the school head of each of the project proponent were invited to present their project to the National Steering Committee and to the members of the Inter-Agency Committee. Signing of the Deed of Understanding followed the clinic and orientation sessions.

Monitoring Teams

Teams of three observers/monitors each were assigned to visit at least two schools, one scheduled and another unannounced (See Annex 2 for the schedule of visits and monitoring teams). Each member of the team was required to observe and report observations independently using common instruments

Monitoring Instruments

To standardize the observation, interviews and FGDs, the observer/monitors used common instruments that included classroom observation forms, focus group discussion guides for students and team members, and interview guide for the teacher implementer and school head. A process-based pre-post test was also developed for each subject area represented. A copy of each of the instruments is in Annex 3.

- Classroom Observation Form 1

This form has an open-ended format. It was used to document what happens in the teaching-learning process as they actually happened. It helped the monitors record the start and end of each part of the lesson. It enabled the observers to describe the interaction between the teacher and students and among students in their small groups.

- Classroom Observation Guide

This form served as a summary checklist of what were recorded in Classroom Observation Form 1. Indicators of good teaching learning practice were divided into five parts: a) classroom learning environment; b) pedagogical

content knowledge; c) teaching disposition; d) classroom management; and e) student's learning process. The monitors recorded in the checklist whether the indicator of good teaching practice was *clearly observed*, *observed*, *needed but not observed*, or *not applicable* in that particular lesson.

- Focus Group Discussion Guide for Students

At least ten students in each class/school attended the FGD. Each observer handled a discussion group. The Guide contained questions to initiate conversation with students e.g., if they found the lesson interesting and why and if the lesson duration was enough to help them understand the concepts. The questions also elicited students' perception of the usefulness and relevance of the innovation used by their teacher comparing the innovation with strategies used by other subject area teachers in school.

- Interview Guide for Teacher Implementers

Each school has one teacher implementer. During the interview, he/she was asked questions focused on problems in handling large classes, how she/he addressed the problems and how the innovation helped in managing big groups of students. Also highlighted were questions on observed significant changes in students' behaviour in terms of class participation, absenteeism, coming late, inattentiveness, and others. Teacher implementers were also asked if the innovation will work with small or medium-size classes and in other subject areas (transferability criterion).

- Focus Group Discussion Guide for Project Leader and Team Members

The members of the team were asked on their contribution to the innovation intervention, their experiences in the implementation of the project, if they have encountered any difficulty, and how the problem was addressed.

- Interview Guide for Principal

The principals were asked about their observations regarding the intervention, if they provided funding or helped the project team in revenue generation, as well as helped generate participation of other teachers and support from parents and the community.

- The Process-based Pre/Post Test

The pretest was administered before the start of the first lesson implementation while the posttest was given after the last lesson in the quarter. The results helped determine whether or not the innovation was effective in developing students' conceptual understanding as well as raising their level of cognitive skills. This was conducted by an external group,

There were 5-subject area tests with 15 items per subject, two in Math (Year 2 and 3) and three in Science Y1, 3, and 4). The test covered topics in the 3rd quarter only.

- Resource Utilization and Cost Effectiveness

During the orientation meeting with the finalists schools, this component of the project was discussed in detail. This was done to ensure that accounting and auditing rules are followed. The resource utilization and cost effectiveness reports were evaluated by the SEI Project team.

The data from the eight forms described above were collated and processed. The Steering Committee and the TWG with SEI Project staff also reviewed the narrative reports submitted by the schools. These instruments were used as bases for ranking the schools for the final award.

Chapter 3 The Six Finalists

The six schools are described in terms of a how they started, their location, enrolment, number of teachers, and performance in the achievement test, at least over three years.

Table 1: Six School Finalists and Subject Area Focus

School	Subject Area Focus	Category
Andres Bonifacio Integrated School	Math 3	LC
Bacong National HS*	Math 2	LC*
Las Pinas East National HS	Science 1	XLC
Looc National HS	Math 3	LC
Navotas National HS	Science 4	XLC
San Isidro National HS	Science 3	LC

*The original participating school was classified as extra large class but the project was moved to [Bacong](#) National High School (BNHS), upon the recommendation of the division schools superintendent, where the Team Leader was assigned as principal.

- **Andres Bonifacio Integrated School (ABIS)**

This school was formerly known as the Andres Bonifacio Elementary School and was converted into an Integrated School by virtue of Rep. Act 9144 on July 30, 2001 and officially operated as an integrated school in S.Y 2002 – 2003. This move was done to answer the growing problem of congestion in Mandaluyong High School.

ABIS is situated in the biggest and most populated *barangay* in Mandaluyong City, Brgy. Addition Hills. From the enrolment of 1,480 in S.Y.

2003-2004, it has grown tremendously to 6,486 at present, brought about by migration from different parts of the country. It caters to the families along the perimeter of the school who dwell on very limited living quarters and derive their daily subsistence from unstable economic resources.

There are 168 teachers (79 in the elementary department and 89 teachers in the secondary department. Its facilities include a building which houses the principal's office, 56 classrooms, two workshops, one library, a dental/medical room, two science laboratories (elementary/secondary), a Guidance office, a computer laboratory (for secondary level), and a 'special room'.

The performance of ABIS in the National Achievement Test (NAT) is shown below. The results were submitted later during the project implementation so it is not clear why students' performance in both science and math went down in 2009 and 2010.

School Year	NAT-Science	NAT-Mathematics
2007-2008	31.18	27.17
2008-2009	40.43	58.46
2009-2010	37.91	36.60

- **Bacong National High School (BNHS)**

Bacong National High School was originally the Bacong Barangay High School, established in 1983 and converted to a national high school in 2002. BNHS has 10 classrooms, one Home Economics room with incomplete facilities, one laboratory room with incomplete facilities, a computer laboratory with eleven functional computers but has no library.

BNHS is relatively a small school with population of 464 in S.Y 2009 to 2010 and 501 in school year 2011-2012. The schools' performance in the National Achievement tests is shown below.

School year	Overall NAT Results	NAT Results in Mathematics
2008-2009	58.63	55.30
2009-2010	52.06	57.54
2010-2011	63.14	41.80

The mean percent score of BNHS is above 50% for both science and math but science decreased in S.Y 2009 to 2010 while in math, the performance decreased in S.Y. 2010 and 2011.

- **Looc National High School**

Looc National High School, formerly known as Looc Barangay High School, was established in 1970. It enrolment has been increasing from 2008-2009 to present as shown in the next table.

School Year	Year Level				Total
	1 ST	2 ND	3 RD	4 TH	
2008-2009	269	223	258	218	968
2009-2010	266	241	237	235	979
2010-2011	326	260	258	254	1098
2011-2012	347	317	271	242	1177
2012-2013	363	320	324	240	1247

Its overall NAT mean percent score from school year 2007-2008 to 2010-2011 is still below 50% (2007-2008 = 47.30, 2008-2009 =38.09, 2009-2010=36.03, and 2010-2011= 45.44). It should be noted that the mps decreased in 2008 -2009 and 2009-2010.

- Las Pinas East National High School

Las Piñas East National High School is in Las Piñas City. It enrolment for 2011-2012 is 4735. They have 130 teachers. The school has 33 academic classrooms, a computer room, a library, but only one science laboratory.

The school submitted NAT results for the last three years but not segregated specifically in science and math.

SY 2008 – 2009: 44.79

SY 2009 - 2010: 40.93

SY 2010 – 2011: 43.16

- Navotas National High School

Navotas National High School is the biggest public high school in Navotas. It was founded in 1983, as Navotas Municipal High School and located in a 2,255 square meter land area near the police headquarters. Its enrolment decreased from 4400 in 2011 - 2012 to 3636 in 2012 -2013. There are 116 teachers across four year levels. Its NAT performance in science and math has been increasing but still below 50%.

SUBJECT AREA	SY 2008 2009	SY 2009 2010	SY 2010 2011
MATHEMATICS	29.53	31.04	37.68
SCIENCE	31.75	31.90	37.57

- San Isidro National High School

San Isidro National High School is a public secondary school located in the outskirts of the buzzing financial district of the City of Makati. It is strategically located to cater to the graduates of four adjacent elementary schools namely: Pio del Pilar Elementary School (Main); Pio del Pilar Elementary School (Annex); Palanan Elementary School; and San Antonio Elementary School.

Year	Number of Sections	Male	Female	Total
First year	9	226	235	461
Second year	8	197	194	391
Third year	8	168	203	371
Fourth year	6	155	187	342
TOTAL	31	746	819	1565

There are 76 active teachers assigned in different academic department (8 and 10 teachers in math and science respectively).

The NAT results of SINHS are shown below. For science, the mps is below 50% except in 2008-2009 and decreased in 2009-2010 and 2010- 2011. For Math, the results for the same period are much lower. The school reported their students' performance in English; these are all above 50% though the results also decreased in 2009-2010.

It would be good to know the nature of the NAT in 2010 to get ideas on why all the six finalist schools (and maybe all schools who participated in the NETRC study) showed a decrease in their mean percent scores. However, NETRC does not release test items.

School year	<i>English</i>	<i>Math</i>	<i>Science</i>
2007 -08	54.22	33.87	43.22
2008 09	61.24	46.79	51.98
2009 -10	50.01	36.69	46.65
2010 -11	51.11	39.92	42.35

It would be interesting to get the NAT score of all the schools for the next years to see if indeed the intervention has an impact on student performance over long term.

Chapter 4

Criteria for Final Judging

The criteria for judging of winners was included in the Project brochure, thus were known to the schools as early as the launching of the Project. The evaluation of the effectiveness of the intervention was based on the following indicators:

- 1) student performance (20%),
- 2) appropriateness of methodology (20%),
- 3) teacher competence on the strategy (20%),
- 4) extent of implementation (25%) to include innovativeness, doability and replicability, and sustainability, and
- 5) resource utilization and cost effectiveness (15%).

The prepost test was externally conducted and externally processed. The data for the 2nd, 3rd and 4th indicators were gathered from classroom observations and interviews while the 5th indicator was evaluated by SEI.

Indicator 1: Student Performance (20%)

Each subject area test contained 15 items and used multiple-choice and constructed-response formats. For the latter type, rubrics were prepared to make the correction process objective and consistent.

The school with highest gain in the pre/posttest gets the 20% score.

Indicator 2: Appropriateness of Methodology (20%)

To evaluate this indicator the intervention strategy should have

- 2.1 used appropriate blended learning and teaching modes like face-to-face and blended online/offline (digital and non-digital) facilities

- 2.1.1 integrated the use of appropriate education technology
- 2.1.2 provided student opportunity to manipulate technological gadgets/devices
- 2.2 used summative/formative performance-based procedures to reliably measure the attainment of lesson objectives
- 2.3 provided varied learning experiences to address differing individual needs and potentials of students in the L classes
- 2.4 utilized appropriate resources for the different needs of students in the L classes
 - 2.4.1 optimized use of varied resources to implement the innovations
- 2.5 practiced class management style appropriate for large classes as shown by assessment results
 - 2.5.1 classroom learning environment arranged to suit the needs of students
 - 2.5.2 with adequate seating space for all students
 - 2.5.3 with adequate writing space for all students
 - 2.5.4 with chair and table for teacher
 - 2.5.5 with adequate lighting
 - 2.5.6 with adequate space for movement between desks
 - 2.5.7 with comfortable ventilation and temperature
 - 2.5.8 with cheerful classroom
 - 2.5.9 with facilities in good working condition
 - 2.5.10 facilities are handled/used with care
 - 2.5.11 assessed learning environment and learning process
 - 2.5.12 used visual aids systematically
 - 2.5.13 assigned specific tasks and responsibilities

- 2.5.14 maintained harmony and camaraderie among students
- 2.5.15 encouraged sharing of ideas
- 2.5.16 adapted to changes in classroom situations
- 2.5.17 gave precautionary measures when necessary
- 2.5.18 supervised the students in performing the activities
- 2.5.19 observed time management
- 2.5.20 ensured students are on task
- 2.5.21 exhibited system of distributing materials and cleaning up after a group work

Indicator 3: Teacher Competence on the Strategy (20%)

The Teacher implementer ...

- 3.1 demonstrated competent content knowledge in the teaching-learning process
 - 3.1.1 provided accurate information/calculation/procedure/drawings
 - 3.1.2 explained in depth and integrated related concepts
 - 3.1.3 connected activity to the concept being developed and to other related concepts
 - 3.1.4 emphasized core ideas on the subject being discussed
 - 3.1.5 demonstrated communicative competence
 - 3.1.6 used appropriate vocabulary that enriched the learning session
 - 3.1.7 demonstrated the needed lab skills correctly
 - 3.1.8 demonstrated appropriate use of instruments
 - 3.1.9 gave directions clearly
- 3.2 showed the ability to relate subject/topic to real life situations using adapted strategy
 - 3.2.1 related the lesson to real life situations

- 3.3 corrected students' misconceptions, notwithstanding the relative large class size
 - 3.3.1 corrected students' misconceptions arising from the activity or related previous lessons
 - 3.3.2 corrected inappropriate use of materials and instruments
- 3.4 used strategy appropriate for large classes as shown by assessment results
 - 3.4.1 maintained inventory of equipment
 - 3.4.2 maximized use of learning equipment and facilities

Indicator 4. Extent of implementation (25%)

Under *innovativeness*, the intervention strategy should have

- 4.1 opened opportunities for students to extend their knowledge and skills by performing tasks and activities that were problem-/inquiry-based
 - 4.1.1 evaluated different solutions or answers to a problem
 - 4.1.2 asked HOTS or probing questions based on the activity and extension of ideas
 - 4.1.3 provided opportunities to explore/investigate concepts/ideas
 - 4.1.4 asked/answered varied questions that cultivated critical thinking/HOTS
 - 4.1.5 used appropriate learning vocabulary
- 4.2 employed varied authentic assessment modes beyond paper and pencil tests
 - 4.2.1 clarified students' understanding of the concept being developed
 - 4.2.2 measured learning using appropriate assessment tools that are congruent to the objectives
 - 4.2.3 used feedback to maximize learning

- 4.3 provided varied and meaningful activities for interaction, cooperative and group-based from teacher-guided to individualized self-directed learning in science and mathematics
 - 4.3.1 used appropriate learning activities that are congruent to the objectives
 - 4.3.2 gave opportunity for group work/collaborative activities
 - 4.3.3 encouraged students to react and interact to questions and situations
 - 4.3.4 interacted during group work/collaborative activities
 - 4.3.5 demonstrated communicative competence
 - 4.3.6 explored/investigated concept/ideas
- 4.4 made teaching and learning of science and math responsive to individual differences in learning needs, abilities, interests, challenges, opportunities, and adapted to local cultural conditions
 - 4.4.1 manifested sensitivity to the needs of the students
- 4.5 encouraged students to develop their creativity and resourcefulness in finding solutions to the problems on hand
 - 4.5.1 gave students adequate time to answer questions
 - 4.5.2 encouraged students to ask questions freely
- 4.6 offered a new insight for other investigators to create, develop or generate new knowledge from the results of the study

Under *doability & replicability*, the intervention should have shown the following good practices in teaching and learning

- 4.7 teaching aids/visuals were easy to find
- 4.8 teaching aids/visuals were improvised
- 4.9 teachers addressed students' questions, misconceptions, areas of confusion, and interventions used
- 4.10 showed evidence of improvement in students' learning outcome

Under *sustainability*, the intervention would have made known the following:

- 4.11 strategies used were applied to other classes/subjects in succeeding quarter/school year
- 4.12 other teachers, mentors and coaches adapted strategies/techniques used
- 4.13 intervention strategies were used by other teachers with minimum or no funding
- 4.14 maintained or surpassed momentum of intervention and other changes.
- 4.15 intervention strategies elicited more interaction among teachers, department heads and school principal for further improvement

The comparative analysis across schools is shown in Annex...

Indicator 5: Resource Generation and Cost Effectiveness

This indicator has five sub-practices:

1. Strategic support for classroom resources were adequate to improve products, research, investigations and learning performance in science and math
2. Financial transaction conformed with accounting and auditing rules and regulations
3. Generated additional funding sources
4. Gave funding priority to innovative classroom interventions & activities that have direct impact on learning outcomes in science & math

Chapter 5 Summary of Results of Evaluation

Based on the criteria for evaluating the project implementation and data culled from several classroom observations, the following features of each school were considered in selecting the two winners. The table of data for Indicators 2-4 are in Annex XX. The evaluation related to cost effectiveness is in Annex XXX.

Evaluation by Indicator and by School

Indicator 1: Student Performance in the Pre post tests

Table X: Scores Gained from Pre-test/Posttest

School	Subject Area and Year level	Number of students who took both Pre and Post Test	Number of student enrolled	Percentage Score Gained from Pre-Test and Post-Test
Andres Bonifacio Integrated School	Math III	44	54	12.6
Bacong National High School	Math II	55	67	21.9
Las Piñas East National High School	Science I	50	75	4.4
Looc National High School	Math III	53	66	30.9
Navotas National High School	Science IV	71	71	19.7
San Isidro National High School	Science III	44	52	8.04

Looc National High School has the highest score gained from pre to post test followed by Bacong National High School. It is remarkable that Navotas National High School had a complete attendance both in the pre and post testing period. LPENHS had the lowest turnout.

Indicator 2: Appropriateness of Methodology

Bacong NHS

- The school used performance-based procedures to measure the attainment of lesson objectives. A project leader-made quarterly proficiency tests were used to determine the effect of BADI. These tests were validated by two math supervisors and three teachers for content, appropriateness and suitability of instruments. Positive increases in the MPS of the students were observed during the intervention (as shown on page [REDACTED]).
- The teacher provided varied learning experiences to address different individual needs and potentials. Several hands-on activities were done inside and outside the classroom such as *Learn and Hunt; Stop and Learn; Pass and Pick, Problem relay; Lumbay Game; Bacong Café; Concentric Circle; and Math Quiz Show*.
- To create a learning environment suited to the needs of students, the PTA building was renovated to serve as a classroom for large classes.
- The teacher assessed the learning environment and learning process regularly by daily brainstorming and mentoring, monitoring of test results, and gathering feedback from students. Special assignments were given to slow learners for practice and mastery.
- Group activities encouraged sharing of ideas and ensured that students were on tasks.

Looc NHS

- The teacher integrated the use of appropriate educational technology and optimized use of varied resources to implement the innovations. Power point presentations helped the students understand the lessons better.

- There were several instruments used to reliably measure the attainment of lesson objectives. These are the flock program pilot testing classroom rating used by observers to rate flock implementation, focus group discussion to solicit information from students about the program, interview of teachers handling the class, monthly student engagement instrument, and teacher's perception survey.
- Varied learning experiences were provided to students such as giving different task assignments, meeting outside of class hour to review lessons, using varied instructional materials and activity sheets, and groups were assigned specific tasks.

Andres Bonifacio Integrated School

- The students were given opportunity to manipulate gadgets/devices. Each student has a kit with ten geotracers and bamboo sticks as manipulatives to show mathematical concepts.
- Specific tasks and responsibilities were assigned to each group of students.
- The teacher used the Discovery and 4As (activity, analysis, application, and abstraction) approaches for the experimental group. Students were taught concepts, principles, and analysis of ideas through guided questions in the control group using conventional protractor and measuring devices.
- The teacher assessed learning formatively by giving them chips once a student recited in class.

Navotas NHS

- The intervention involved the use of a projector on a mobile cart (MCART) to improve visibility of lessons given by the teacher. Video clips, animated and interactive lessons were used by the teacher.

San Isidro NHS

- The intervention, called *i-motion*, is an all-in-one cabinet with flat screen TV, educational compact discs, flip charts and lab kits for science experiments.
- The *i-motion* was not only used by the teacher. With teacher's supervision and clear instructions, the students were allowed to use the all-in-one cabinet.

Las Pinas NHS

- The intervention involves the use of differentiated assisted tools to address the different learning styles of students. The tools used were the following: community-based modules, Learning Resource Station, Self-Directed Teaching Cards, Student Portfolios/Projects, Student's Mailboxes (Q&A), Teaching Card, lab activities, film showing, debate, song writing, journal writing, and reporting.
- The Mean & Hake (HG) instrument was used to classify the learning styles of the students. They were classified as visual, verbal, aural, physical, logical, social, and solitary learners.
- The students were grouped together according to their learning styles.

Indicator 3: Teacher Competence on the Strategy

Bacong NHS

- The teacher effectively used the various strategies appropriate for large classes as shown by the assessment results. BADI proved to be a good strategy in improving the performance of the class in quarterly examinations.

Looc NHS

- The teacher connected each activity to the concept being developed and to other related concepts. She gave many examples.
- The teacher demonstrated communicative competence. She spoke well both in English and Filipino.
- The activity sheets used by the teacher served as a good guide for students to follow.

Andres Bonifacio Integrated School

- The teacher demonstrated well the appropriate use of geotractor.
- The teacher related the basic application of the angles and triangles in real life.
- The effective use of the geotractor by the teacher had a positive effect on the students' grades.

Navotas NHS

- The teacher demonstrated fairly well mastery of the subject matter.
- The teacher ensured that students were on task.
- The teacher maximized the use of the M-CART.

San Isidro NHS

- While the teacher demonstrated communicative competence, demonstrated the needed lab skills, and maximized use of the *i-motion*, she was not able to explain in depth and integrated related concepts nor was she able to show the relationship of the subject/topic to real life situations.

Las Pinas NHS

- The teacher observed time management.
- The teacher failed to address students' misconceptions detected in student answers.

Indicator 4: Extent of Implementation

A. Innovativeness

Bacong NHS

- The intervention strategy provided varied and meaningful activities for students to extend their knowledge and skills by performing interactive, cooperative and group-based, problem-based tasks.
- The intervention strategy gave opportunities for immediate feedback from students regarding the activities.
- Activities were done in and out of the classroom, which encouraged students to adapt to different situations.
- The group interactions harnessed the students' communicative competence, such as listening and speaking as well as reporting.

- The school manifested sensitivity to the needs of the students by implementing fund-raising activities to help them financially, purchase supplies for the program, and finance the prizes for math wizards.

Looc NHS

- The flock or group innovation encouraged each group member to discuss among themselves a particular problem. The group members interacted intelligently in every activity.
- The students demonstrated communicative competence as shown by their performances in the group presentations and recitations.
- The intervention strategy gave students opportunities to explore and investigate various concepts and ideas in their group exercises.

Andres Bonifacio Integrated School

- Through the use of geotractor, the students were allowed to solve a particular problem in Geometry using different solutions or process.
- The teacher gave opportunity for group work, where students were encouraged to react and interact to questions and situations.
- The use of the geotractor allowed the students to explore concepts and ideas.
- Students were given adequate time by the teacher to answer questions. They were also free to ask questions addressed to both the teacher and their classmates.

Navotas NHS

- M-CART made the lessons more interesting to the students because of the demonstrations and clips shown, which otherwise would be difficult to perform in class.

San Isidro NHS

- The teacher manifested sensitivity to the learning needs, abilities, and interests of the students by responding to all their questions and clarifications.

Las Pinas NHS

- The students were encouraged to react and interact to questions and situations, especially during group work activities.
- Students were encouraged to ask questions freely.

B. Doability and Replicability

Bacong NHS

- The intervention showed evidence of improvement in students' learning outcomes.
 - They were able to answer questions orally in the monthly math quiz show.

- The mean percent scores (MPS) of students in quarterly examinations increased.

Looc NHS

- The teacher addressed students' questions, misconceptions, and areas of confusion through the intervention used:
 - The teacher answered students' questions while the activity is going on.
 - The teacher spent time after class to answer some students' concerns on the lesson.
- The intervention showed evidence of improvement in students' learning outcome:
 - Students' performance in tests and recitations improved as a result of the innovation.

Andres Bonifacio Integrated School

- The intervention showed evidence of improvement in students' learning outcome: test/seatwork results improved.

Navotas NHS

- Teaching aids were easy to find as these were already included in the M-CART.

San Isidro NHS

- Since all the teaching aids are inside the i-motion, they were easy to find.
- Some of the teaching aids, especially the visuals were improvised.

Las Pinas NHS

- The teacher was able to address students' questions.

C. Sustainability

Bacong NHS

- The innovation has been implemented not only in science and math classes, but also in other subjects.
- The intervention strategies elicited more interaction among teachers and the school principal. Parents and the local/barangay officials provided financial support for the innovation.

Looc NHS

- The flock method was applied, not only in all the four classes of the teacher implementer, but also in other sections of the third year classes.
- The innovation paved the way for the increased collaboration among different school officials: guidance counselor, math teachers, supervisors, and the school principal.
- The Flock Program also gained the support of the school division and local government officials.

Andres Bonifacio Integrated School

- No indications of sustainability were apparent.

Navotas NHS

- M-CART was used by other teachers. It was utilized in eight (8) different subjects.

San Isidro NHS

- The *i-motion* was used in three other classes of the teacher implementer.
- The *i-motion* was used in other subjects: English, Filipino, *Araling Panlipunan*, Drafting, and others.

Indicator 5: Cost Effectiveness

Las Pinas NHS

- Allocated budget that ensured cost-effectiveness

Chapter 6

The Winners

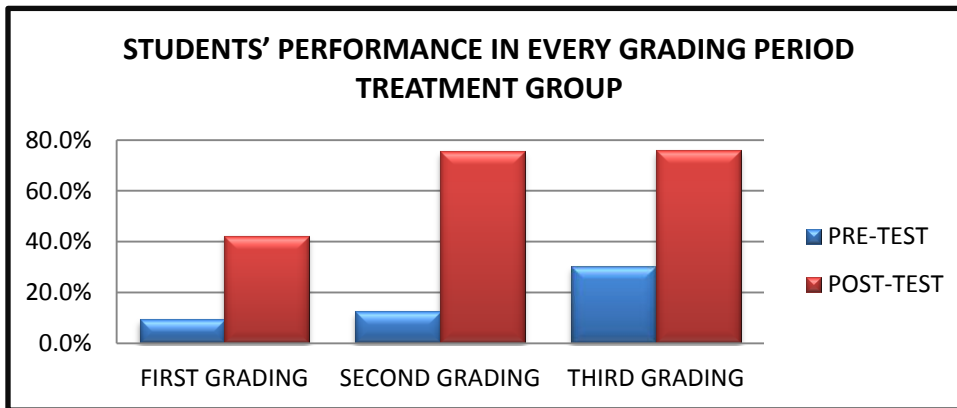
The Board of Judges selected two projects to receive the innovation award: and the Flock Program. (BADI Bacong National High School, in and Looc National High School, in Calamba City, Laguna

- A.** Bacong Developmental Instruction (BADI)
Bacong National High School
Salug, Zamboanga del [Norte](#)

Project BaDI or Bacong Development Instruction was organized to achieve the following:

- a. To motivate every student in a large class to participate actively in the daily learning process;
- b. To increase students' academic performance in every grading period;
- c. To increase the students' performance in the National Achievement Test;
- d. To promote positively strong parent-teacher relationship by increasing the number of homeroom meetings of parents and teachers from 4 to 9 times in a school year; and
- e. To build strong linkages with local executive officials by submitting quarterly reports on the implementation and development of Project BaDI.

With just one year of implementation, BNHS achieved almost all of what they aspired for using BADI. In terms of student performance, the treatment group showed increasing results from 42.31% in the first quarter, 75.60% in the second quarter, and 75.97% performance in the third quarter. On the other hand, the performance of students in the Control Group from 1st to 3rd quarter remained below 30%.



Though originally intended for first and second year science and math classes, the innovations in the Project has become a whole-school approach to teaching and learning. Other teachers were motivated to try BADI activities in their own classes because it helped manage a large-size Math class. They observed that it nurtured students' sense of understanding and learning from discovery to mastery of certain concepts in Mathematics. It provided opportunities for students to maximize lifelong learning through hands-on activities and positive approaches to learning. It minimized teachers' input, elicited more ideas from students, and encouraged more students' involvement. It used simple materials, motivated learners to work in groups, exposed students to varied activities enabling them to assesses their own performance and achievement, and allowed them to reflect on the impact of learning-by-doing.

Daily attendance was around 99%. Through varied interactive activities, student engagement was observed to be very high; their energies and enthusiasm were directed to a productive undertaking. Moreover, Project BADI has been able to establish a strong and sustainable school and community partnership. It generated PTA's strong support to the students' learning process through active follow-ups of daily assignments while the local executive officials supported acquisition of instructional materials and provided cash

incentives to the top performing students.

The interventions were considered effective in raising student performance based on a common pre/post tests given to all six schools. BNHS got the second highest gain among the finalists. And most of all, BADI promoted and developed students' self-esteem, social skills, inter-tribe relations, communication skills as well as enhanced learning satisfaction and enjoyment while learning.

**The Flock Program
Looc National High School
Calamba Laguna**

The Flock Program aimed to improve the quality of teaching and learning of Mathematics III (Geometry) in LNHS. At the end of the SY 2011-2012, the school aimed to:

- develop innovative practices intended for handling large class in Mathematics III;
- pilot test the innovative practices; and
- evaluate the effectiveness of the Flock Program based on Student Engagement and score of the students in the pre-test and post-test

The daily conduct of flock test, flock activities and monitoring resulted in the high performance of students. Students, teachers, team members, the school principal had positive feedback on the program. The monitoring team from SEI, the steering committee and technical working group had very positive feedback on the program. Students in the experimental group had higher mastery level in geometry compared with students in the control group. Students in the experimental group have a higher level of engagement

(behavioural, emotional and cognitive) compared to the students in the controlled group.

Given that Geometry is a difficult subject for most students, it is this class that showed the highest pre-post test gain, meaning it has the highest effectiveness of intervention on student performance (30.9).

The intervention was successful because the planning and internal monitoring was efficient and effective. The teacher has a good grasp of subject matter, used visual ways of presenting the lesson, [and](#) allowed students to ask question, thus getting the interest and attention of students. As an innovation strategy for teaching and managing large classes, the Flock Program worked at the advantage of the students; they had become more active participants in the learning process, more focused and responsible, while attendance in class greatly improved. Dropout rate has been lessened. There was no difficulty on the part of the teacher in monitoring the attendance because each Flock team had its own monitor to report to the teacher. The teacher also gave incentives to motivate the students. For the teacher, the principal and other stakeholders the Flock session is a big help in teaching a large class size.

The Flock program not only modelled a learner-centred instruction but importantly, a sustainable, replicable, and coordinated program. With just one year of implementation of the project, Looc National HS has developed an effective flock program in managing large classes. No wonder that the Flock Program gained the support of school division and local government officials.

Chapter 7

Lessons Learned and Recommendations

Managing large classes is a challenging and tiring task. This is one of teachers answers when ask why many students do not actively participate in class and the performance in assessment studies is low.

This Search for Innovative Practices in Managing Large Classes was conceptualized to address some, if not all, problems related to overpopulated classrooms. The intention was to document best practices so that they can be shared with schools and teachers. These intervention strategies were believed to improve the quality of teaching and learning science and math in public and private high schools with class size of more than 50 students.

However, only 34 from about more than 5000 secondary schools in the country responded to the call and only six qualified. The reasons for non participation in the Search and the low number of accepted proposals are varied. But it clear that teachers need help to cope with increasing school population and how to acquire skills in preparing good research proposals.

This Project showed that indeed, there are innovative practices in managing large classes. Even the four other intervention strategies that did not win in the final judging have potential for improving teaching of science and math. It is important however, that teachers realize that even with digital technology, a learner-centred and inquiry-based or problem-based instruction should still predominate, especially in science and math classes. For example, computers should not be used to convert lessons into power point presentations but rather to enrich learning of topics that are abstract, if activities are dangerous or difficult to do, or if the teacher does not feel very confident to discuss the lesson.

Teacher should also improve on their assessment skills by practicing on how to make questions that assess learning beyond recall of facts and terms.

But most of all, activity results must be processed very well so that students derive the concepts from the activities rather than giving first a lecture on a topic and asking student to perform an activity to confirm or verify the idea already presented.

The Science Education Institute of DOST should consider expanding the Project by doing another Search in the succeeding years. But it is important that teachers be exposed to strategies in preparing research proposals with literature support. It is also recommended that teachers share their best practices starting with other teachers in their own communities, then beyond. And since one of the long term goal of the intervention is to help raise students' performance, the schools have to be continuously monitored, especially on any improvements on the innovation as how this impact on their NAT performance.

ANNEXES

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