



PHILIPPINE
NORMAL
UNIVERSITY



Graduate Dissertations

CGSTER

March 2014

Development of a Management Framework to Enhance the Science, Technology, and Engineering (STE) Program in Calabarzon Region

Adrian C. Guinto

Philippine Normal University

Follow this and additional works at
pnu-onlinecommons.org/omp/index.php



Online Commons Citation

Guinto, A.C., Ibañez, A.G., Villena, D.K. (2014)
Development of a management framework to enhance the science, technology, and
engineering (STE) program in calabarzon region
(Dissertation, Philippine Normal University)
Retrieved from pnu-onlinecommons.org/omp/index.php/pnu-oc/catalog/book/169



Philippine Normal University
The National Center for Teacher Education

**DEVELOPMENT OF A MANAGEMENT FRAMEWORK TO ENHANCE
THE SCIENCE, TECHNOLOGY, AND ENGINEERING (STE)
PROGRAM IN CALABARZON REGION**

A Dissertation Presented to the
Faculty of the College of Graduate Studies
and Teacher Education Research
Philippine Normal University
Manila

In Partial Fulfilment of the
Requirements for the Degree,
Doctor of Philosophy (Ph. D) in Education
With specialization in Educational Management

ADRIAN CALDERON GUINTO
March 2014



Philippine Normal University
The National Center for Teacher Education

APPROVAL SHEET

In partial fulfilment of the requirements for the degree of Doctor of Philosophy in Education with specialization in Educational Management, this dissertation entitled “**DEVELOPMENT OF A MANAGEMENT FRAMEWORK TO ENHANCE THE SCIENCE, TECHNOLOGY, AND ENGINEERING (STE) PROGRAM IN CALABARZON REGION**” prepared and submitted by **ADRIAN C. GUINTO**, is hereby recommended for approval and acceptance.

DANILO K. VILLENA, Ph. D.
Adviser

ALEJANDRO G. IBÁÑEZ, Ph. D.
Adviser

Approved in partial fulfilment of the requirements for the degree, Doctor of Philosophy in Education with specialization in Educational Management by the Oral Examination Committee.

ZENAIDA Q. REYES, Ph. D.
Dean
Chairperson

JOSE M. OCAMPO Jr., Ph. D.
Member

RENE R. BELECINA, Ph. D.
Member

LETICIA V. CATRIS, Ph. D.
Member

Accepted in partial fulfilment of the requirements for the degree, Doctor of Philosophy in Education with specialization in Educational Management.

Date

ZENAIDA Q. REYES, Ph. D.
Dean
College of Graduate Studies and
Teacher Education Research



ACKNOWLEDGEMENT

The completion of this manuscript wouldn't have been realized without the support of people who have been sent and used as instrument in helping the researcher to finish this undertaking.

Profound appreciation is therefore extended to:

Dr. Zenaida Q. Reyes, Dean of the College of Graduate Studies and Teacher Education Research for her intelligent critique of the paper and more importantly, for her valuable suggestions in its over-all improvement;

Dr. Danilo K. Villena, the former Dean of the College of Education, Philippine Normal University and one of the researcher's dissertation advisers, for his noteworthy advice, comments and suggestions that provided him the right direction in the pursuit of working and eventually finishing this academic work;

Dr. Alejandro G. Ibañez, is dissertation adviser for the significant contribution in examining the manuscript. His expertise and rich experience in research helped the researcher to improve the dissertation;

The members of the Pre- Oral Examination Committee composed of Dr. Jose Rizal Sanchez, Dr. Gabriel G. Uriarte, Dr. Rene R. Belecina, Dr. Jose M. Ocampo Jr. and Dr. Roderick Tadeo for their conscientious efforts in examining the researcher's dissertation proposal and for their constructive comments and suggestions that helped him improve the manuscript;

The members of the Final Oral Examination Committee chaired by the Dean herself, Dr. Zenaida Q. Reyes with Dr. Letecia V. Catris, Dr. Rene R. Belecina, and Dr. Jose M. Ocampo Jr. for allowing him to undergo such a tedious process of presenting and defending his dissertation, and also for their valuable and intelligent suggestions and recommendations to make this academic;

Ms. Evelyn G. Pascual and Ms. Malou for their kind- hearted assistance and support extended to the researcher;

The school heads, head teachers, master teachers, and science and mathematics teachers in Batangas National High School, Bucal National High School, Lipa City,



Science High School, Pedro Guevarra Memorial National High School, and Quezon National High School for sharing their time in answering the questionnaire and interview;

Dir. Diosdado San Antonio, the Regional Director in Region IV CALABARZON, for his warm accommodation and expertise in validating the research instrument;

The experts in the field of educational management who shared their time in validating the instruments; Dr. Josilyn S. Solana, Division Superintendent, Division of Tanauan City; Dr. Crestito Pamplona- his thesis adviser and former Division Superintendent of Lipa City; Dr. Erlinda Navarro, Dr. Nilo E. Colinares, Dr. Roderick Tadeo, Dr. Gabriel Uriarte, Rev. Father Ferdie Bautista, Dr. Joy Talens, and Dr. Alice Botardo for their comments and suggestions that truly improved the instruments in order to become appropriate in the study;

Dr. Cosme R. Magbojos, for the spiritual guidance and support that truly add motivation to the researcher in completing the degree.

A.C.G.



DEDICATION

The source of wisdom

To our **LORD FATHER** in Heaven

My strength and inspiration....

My ever supportive wife- **LOWELA ASIS- GUINTO**

To the precious gift and the fruit of our love
our beloved son,

BHADJI ANDREW

My parents

ALFREDO L. GUINTO and **LETECIA C. GUINTO**

My siblings

Adonis, Arnel, Myla, Maricor, and Adolfo

My in-laws

ELMER B. ASIS and **LETTY D. ASIS**

And

To the implementing schools of Science, Technology, and Engineering (STE) Program
In CALABARZON Region

I offer this work.....

A.C.G.

*“For I Know the Plans I have for you,
Plans for Hope and a Future”
Jer. 29:1*



ABSTRACT

Title	:	DEVELOPMENT OF A MANAGEMENT FRAMEWORK TO ENHANCE THE SCIENCE, TECHNOLOGY, AND ENGINEERING (STE) PROGRAM IN CALABARZON REGION
Researcher	:	ADRIAN CALDERON GUINTO
Degree	:	Doctor of Philosophy
Specialization	:	Educational Management
Advisers	:	DANILO K. VILLENA, Ph. D. ALEJANDRO G. IBÁÑEZ, Ph. D.
Key concepts	:	Program Assessment Science, Technology and Engineering (STE) Program Management Framework

This study assessed the status of implementation of the Science, Technology, and Engineering (STE) Program in CALABARZON Region along its nine (9) areas namely; management and leadership, curriculum management, student achievement, professional development, partnership building, financial management, support system, tracking of students, and monitoring and evaluation. The findings of the study served as bases in developing a management framework which aimed to enhance and strengthen the implementation of the program. Using a descriptive- development research design, this study involved five (5) original secondary schools implementing the program where five school heads, eleven department heads, eight master teachers, and forty-three science and mathematics teachers who were purposively selected to



constitute the groups of respondents. A self- made validated research questionnaire together with an unstructured interview guide were used to gather information needed in the study. The instrument underwent the process of validity and reliability. Data obtained from the instrument were analyzed through the use of statistical tools which include frequency, percentage, and weighted mean.

Findings revealed that the management and leadership, curriculum management, students' achievement, professional development, support system, and tracking of students in the five schools were rated by the respondents as highly implemented. On the other hand, the respondents rated partnership building, financial management, and monitoring and evaluation as moderately implemented. Based from the results the strengths and weaknesses in the implementation of the program were identified.

Based on the findings of the study, it can be inferred that generally, the five original secondary implementing schools of Science, Technology, and Engineering (STE) Program in CALABARZON region highly implemented the components of the program. However, disparity in the total quality assurance (TQA) ratings suggested that further enhancement of these areas are needed.

It was recommended that enhancement of all areas must be given more attention in order to achieve the objectives of the program. Similarly, the implementing schools are encouraged to constantly monitor and assess the implementation of the program. They are also encouraged to adopt the proposed



management framework. Furthermore, future researchers are also encouraged to perform parallel study to verify the findings of this study.



Table of Contents

	Page
Title Page	i
Approval Sheet	ii
Acknowledgement	iii
Dedication	iv
Abstract	v
Table of Contents	vi
List of Tables	vii
List of Figures	viii

CHAPTER

1 . THE PROBLEM AND ITS BACKGROUND

Introduction	1
Theoretical Framework	11
Conceptual Framework	17
Statement of the Problem	44
Significance of the Study	45
Scope and Delimitation	47
Definition of Terms	49

2. REVIEW OF RELATED LITERATURE

Program Assessment	55
Science Education.....	64
Management and Leadership of the STE Program.....	72
Curriculum Management	99
Student Achievement	102
Professional Development.....	106
Partnership Building.....	115
Financial Concerns.....	121
Support System	134
Tracking of Students	136
Monitoring and Evaluation	141

3. RESEARCH AND METHODOLOGY PROCEDURE

Research Design	157
-----------------------	-----



Respondents and Sampling Technique	159
Research Phases	160
Validation of the Instruments	163
Reliability of the Instrument	164
Data Gathering Procedure.....	166
Data Analysis	167

4. PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

On the Planning Component of STE Program.....	161
On the Organizing Component of STE Program.....	165
On the Leading Component of STE Program.....	168
On the Controlling Component of STE Program.....	170
On the Curriculum Management Component of STE Program	178
On the Student Achievement Component of STE Program	182
On the Professional Development Component of STE Program	184
On the Partnership Building Component of STE Program	189
On the Financial Concern Component of STE Program	193
On the Support System Component of STE Program	196
On the Tracking of Students Component of STE Program	199
On the Monitoring and Evaluation Component of STE Program	202
Strengths and Weaknesses of the Components of STE	



Program	208
---------------	-----

Proposed Management Framework to Enhance the Science, Technology, and Engineering (STE) Program in CALABARZON Region	211
--	-----

5. SUMMARY, CONCLUSIONS, AND RECOMMENDATION

Summary	231
Findings	232
Conclusions	233
Recommendations.....	233

REFERENCES

APPENDICES

CURRICULUM VITAE



LIST OF TABLES

Tables		Page
1	Respondents of the Study.....	151
2	Results of the Experts' Validation.....	154
3	Result of Test of Reliability.....	157
4	Rating Scale.....	159
5	Computed Mean of Planning Component.....	163
6	Computed Mean of Organizing Component.....	166
7	Computed Mean of Leading Component.....	169
8	Computed Mean of Controlling Component.....	171
9	Summary of Management Functions.....	173
10	Computed Mean of Leadership Component.....	175
11	Computed Mean of Curriculum Management.....	180
12	Computed Mean of Students' Achievement.....	183
13	Computed Mean of Professional Development.....	185
14	Computed Mean of Partnership Building.....	190
15	Computed Mean on Financial Management.....	193
16	Computed Mean on Support System.....	197
17	Computed Mean on Tracking of Students.....	199
18	Computed Mean on Monitoring and Evaluation.....	203
19	Strengths and Weaknesses of the Program.....	208



LIST OF FIGURES

Figures		Page
1	Conceptual Framework of the Study.....	41
2	Research Paradigm.....	149
3	Proposed Management Framework of STE Program.....	216
4	Schematic diagram.....	219



Philippine Normal University

The National Center for Teacher Education

Chapter I

THE PROBLEM AND ITS BACKGROUND

Introduction

One of the challenges confronting the school leaders and managers is on how they could effectively deliver quality leadership and sound management to the end that will improve the learning outcomes of learners. There is a wide recognition that the significance of the effective leaders and managers in educational system cannot be undervalued. The leadership and management in educational landscape in the 21st century have an increasing importance for the transformation of society (Bush, 2005). This widespread belief makes the governments in developed and developing countries to recognize that their main assets are the people who possess skilled and are able to compete in a demanding and competitive workplace.

Leaders' actions often carry more weight than the actions of others within an organization because they have greater responsibility and accountability in more visible positions. They are the ones who can set the tone, create the plan, and demonstrate to their followers the appropriate (or inappropriate) way to behave. Educators introduce various innovations in pursuit to improve the quality of learning. Most of these innovations toward better school outcomes assigned outmost importance to the quality of leadership and management in the school (San Antonio, 2004).



Philippine Normal University

The National Center for Teacher Education

Many research literature and studies pointed that the critical roles of school principals in the success and enhancement of school are indispensable. Falogme (2011) asserts that many researches especially in education led to the improvement and realization of goals of Department of Education in making school provider of all educational priorities. Jones (2007) added that educational institutions worldwide have high accountability measures which set forth criteria for the effectiveness of leadership and management of school principals that resulted to students' outcomes. These statements are consistent to the preamble of the World Declaration of Education for all (EFA), Article 1 which states that:

"Every person- child, youth and adult shall be able to benefit from educational opportunities designed to meet their basic learning needs. These needs comprise both essential learning tools (such as literacy, oral expression, numeracy, and problem solving) and the basic learning content (such as knowledge, skills, values, and attitudes) required by human beings to be able to survive, to develop their full capacities, to live and work in dignity, to participate fully development, to improve the quality of their lives, to make informed decisions and to make continue learning".

Effective School Research (in Suber, 2011) suggests that successful students learning is linked to the alignment of instructional and assessment; focus professional development; effective monitoring of instruction; reduction of teacher attrition, and positive school culture. Successful school principals are closely involved with the teacher's instruction and students' learning in their schools.

In the Philippines, the implementation of Republic Act No. 9155 otherwise known as the "Governance of Basic Education Act of 2001" strengthens the critical



Philippine Normal University

The National Center for Teacher Education

roles of the school heads by empowering them in their authority, accountability, and responsibility in leading and managing the schools. Consistent with the law, national educational policies, plans, and standards, the school heads have the authority, accountability, and responsibility in (a) setting the mission, vision, goals, and objectives of the school; (b) creating an environment within the school that is conducive to teaching and learning; (c) implementing, monitoring, and assessing the school curriculum and being accountable for higher learning outcomes; (d) developing the school program and school improvement plan; (e) offering educational programs, projects and services which provide equitable opportunities for all learners in the community; (f) introducing new and innovative modes of instruction to achieve higher learning outcomes; (g) administering and managing all personnel, physical and fiscal resources of the school; (h) recommending the staffing complement of the school based on its needs; (i) encouraging and enhancing staff development; (j) establishing school and community networks and encouraging the active participation of teacher organizations, non- academic personnel of public schools, and parents- teachers- community associations; (k) accepting donations, gifts, bequests and grants in accordance with existing laws and policy of the Department of the purpose of upgrading teachers/ learning facilitator's competencies, improving and expanding school facilities and providing instructional materials and equipment. Such donations or grants must be reported to the Division Superintendent; and (l) performing such other functions as may be assigned by the Secretary, Regional Director and Schools Division Superintendents where they belong (DepEd Order No. 1, s. 2003).



Philippine Normal University

The National Center for Teacher Education

There is no doubt that the authority and accountability of the school heads in the outcomes and success of the educational programs is very crucial. The success and failure in the delivery of educational programs being implemented and supported by the Department of Education heavily lie in the leadership and management skills of the school leaders. Improving the students' learning is one of the challenging and perennial problems happening worldwide that is why, in pursuit in improving and raising the academic achievement and learning outcome of students, educators introduce innovations which according to San Antonio (2004), move toward better school outcomes. In the same view, Lopus concurs that:

"... improving basic education rest on the ability to create strong and capable school that "can be made possible through a rational devolution of powers to the school and its community. As seen in many examples both here and abroad, an empowered school shall be in the best position to create dramatic improvements with the school administrators and teachers serving as catalysts for community participation and all stakeholders taking part in the reform efforts in specific schools or school clusters". Let it serve as a model for quality learning throughout the country beyond the cement, wood, and steel, turn the building into a living learning community that can provide your youth the education they need and deserve".

Innovation in Science Education

There is consensus worldwide that the role of science and technology for the advancement and development of an economy and the society cannot be undermined. The need for the scientifically populace is increasingly recognized as critical in the development in many countries. In the current administration, President Ninoy B. Aquino, places and gives priority in the improvement of science and mathematics as he



included these disciplines in his 10 point- education agenda. His administration recognizes that strengthening the implementation of the science oriented schools would help in producing more scientifically inclined individuals who will become feeders in developing the country.

Prior to this, an effort to improve the quality and effectiveness of the secondary schools was initiated. One of the innovations introduced in the Philippines was the Engineering and Science Education Project (ESEP). Ogena and Browner (1998) stressed that countries wanting to improve their people's quality of life cannot escape the demand to harness their science and technology capability as a way of developing competitiveness. It is therefore important to be guided by past and present experiences on science education to be able to recognize the turning points for the country's future.

In its continuing effort to improve the quality of science education in the country, the Department of Science and Technology (DOST), in coordination with the Department of Education, Culture, and Sports (DECS) implemented the Engineering and Science Education Project (ESEP). The role of science and technology education in Philippine development is well recognized. Article II of the Philippine 1987 Constitution mandates that:

"the state gives priority to research and development in science and technology education, to support indigenous, appropriate and self- reliance technology capabilities and their application to improve national productivity and lifestyle of the Filipino people."



Philippine Normal University

The National Center for Teacher Education

The Engineering and Science Education Project (ESEP) was a brainchild of the Department of Science and Technology (DOST) in coordination with Department of Education Culture and Sports, which is responsible for overall education policy and school supervision in the Philippines. DOST and DECS have signed a Memorandum of Agreement confirming their respective project roles. The project was financed by the Philippine Government with support from the World Bank and the Japanese Government for five years. In the implementation completion report of the Engineering and Science Education Project (Loan 3435-PH) of the Philippines submitted to the World Bank, it stated that the project's overall objective was to upgrade the country's industrial and technological capability by increasing the supply of qualified high-level science and technology (S&T) manpower. The project aimed to (a) strengthen the institutional framework and the criteria for funding and monitoring the quality of engineering and science education; (b) strengthen engineering and science education in priority fields at selected institutions; (c) improve science and mathematics education at selected secondary schools; and (d) strengthens DOST's capacity to plan and coordinate S & T manpower development programs. It has several components and one of which is the Science and Education Manpower Development Program (SEMDP) which aims to improve the quality of science and mathematics education at the secondary level and specifically, to develop a critical mass of scientifically literate graduates who will serve as feeders to S & T courses.



The project was implemented during the school year 1993- 1994 in 110 selected public high schools that later known as Science and Technology- Oriented High Schools, under Department of Education which is authorized to implement an enriched science curriculum. Under the SEMDP, the schools implementing the program were provided with laboratory buildings, laboratory equipment, library facilities, supplementary instructional materials, especially trained teachers and a special science curriculum. These inputs were meant to provide and appropriate environment for teaching and learning science and mathematics, so that more students will be motivated and encouraged pursuing S&T courses and careers. There were clear guidelines in selecting students who will qualify to be admitted in the Special Science Classes. A scholastic Aptitude Test was administered to entering freshmen to measure and determine the intellectually “qualified” to be in the program. The effectiveness of the program was assessed through the administration of achievement test and the result was compared to the students from regular class.

After five years of implementation the contract agreed by the DOST and funding agency, which is the World Bank, was terminated in the school year 1997-1998. However, it was not completely abolished because the implementation and monitoring of the program was given to the Department of Education (DepEd) to continue the program. Meanwhile, the name was changed to Engineering and Science Education Program (ESEP) and this was done so that the fund will be allocated through DepEd General Appropriation to support and fund the implementation of the program.



Philippine Normal University

The National Center for Teacher Education

In 2007, the original 110 secondary public high schools implementing the program increased to 198 as more secondary public high schools showed interest in implementing the program (DepEd Order No. 54 s. 2007).

In the CALABARZON region alone, ten (10) public secondary schools were added to the five (5) original public secondary schools implementing the Engineering and Science Education program since 1993. The encouraging increase in the number of schools implementing the program approved by the Department of Education is a strong indication that the institution is very serious in strengthening the science culture and become feeders of future scientists and mathematicians in the country more specifically, in the workplace where the scientists and mathematicians are highly demanded.

In a nutshell, the current scenario and reforms in education particularly in science and mathematics education, the above premises revealed how the government through the Department of Education exhausting all its resources in order to strengthen the status of the science and mathematics education in the country. The constraints in the implementation of the educational programs more specifically, the Science, Technology, and Engineering (STE) Program are being addressed by providing the implementing schools of inputs which would help to strengthen the implementation of the program. However, despite of all attempts in improving the special science program, studies and results of national and international standardized test showed that the performance of students in science and mathematics particularly those who are in



the special science program was lagged behind compared to the students in other countries. This is one of the strong manifestations that the science and mathematics education in the country deserves to be given more attention that is, if the country wants to improve the performance of students in science and mathematics.

Similarly, the researcher contends that if the science and mathematics education are to improve, different components of the program should be given equal attention. The holistic view more specifically, on how the school principals of the schools implementing the special science program manage the program must be given most consideration.

Although, there is an existing science and technology framework which aims to develop scientific and technological literacy among students however, it focuses only in one component while the management of the program is not clearly defined.

The researcher believes that there is so much to be done for the continuous improvement of the program and its potential as effective mechanism to positively develop students who will respond to the needs of the country in developing more scientists and engineers who would contribute for the advancement and development of the country. Likewise, the assessment in the management of the school heads in the implementing schools is one of the first initiatives in revisiting how well these schools implement the program.



Philippine Normal University

The National Center for Teacher Education

Considering the increasing number of schools implementing the special science class in the Philippines and the high expectations in developing immense demand for people who are scientifically and mathematically literate, it is timely to find out and look into the status of the implementation of the special science program and offer a framework which would provide direction for the effective implementation of the program. It is assumed, the proposed framework would serve as foundation for the newly recognized secondary schools in CALABARZON region for the implementation of the Science, Technology, and Engineering (STEP) Program hence, this study is conducted.

Theoretical Perspective of the Study

The theories presented in this study were based on models of educational management espoused by Drucker, Bush, Bolman and Deal.

One of the management theories that this study was anchored on, was the Management by Objectives or the MBO. Management by objectives is a process of setting mutually agreed – upon goals and using those goals to evaluate employees' performance. It is a process whereby the superior and subordinate managers on an organization jointly identify its common goals; define each individual major areas of responsibility in terms of results expected from them. The subordinates play a major role in setting their own objectives and not merely receiving objectives from above. MBO is both a philosophy and an approach of management process in which the superiors and subordinates sit together to identify the common objectives and set the



Philippine Normal University

The National Center for Teacher Education

goals which are to be achieved by the subordinates, assess the contribution of each individual and integrate individual objectives with those of the organization so as to make the best use of the available resources of the organization.

The principle of management is needed to give full scope to individual strengths and responsibilities and at the same time provide a common direction to vision and effort, establish teamwork and harmonize the goals of the individuals with the common organizational goals (Drucker, (1954)

Management by objectives intends to measure and judge performance; relates individual performance to organizational goals; fosters the increasing competence and growth of the subordinates; enhances communication between superior and subordinates; serves as basis for judgment about promotion and incentives; stimulates the subordinates; motivation; and serves as device for organizational control and integration (Levinson, 1970).

Bush on the other hand, classifies the management models into six types; Formal, Collegial, Political, Subjective, Ambiguity, and Cultural.

Formal models assume that organizations are hierarchical system in which managers use rational means to pursue agreed goals. Heads possess authority legitimized by their formal positions within the organization and are accountable to sponsoring bodies of activities of their organization (Bush, 2003). The formal model tends to treat organization as a system; it gives prominence to the official structure of



Philippine Normal University

The National Center for Teacher Education

the organization; the official structures of the organization tend to be hierarchical; all formal approaches typify schools as goal-seeking organizations; it assumes that the managerial decisions are made through a rational process; the formal approaches present the authority of leaders as a product of their official positions within the organization. In formal models there is an emphasis on the accountability of the organization to the sponsoring body.

Collegial models assume that organization determine policy and make decision through a process of discussion leading to consensus. Power is shared among some or all members of the organization who are thought to have a shared understanding about the aim of the institution. Collegial models are normative in orientation; it is appropriate for organization such as schools and colleges that have significant number of professional staff; the model assumes a common set of values held by the members of the organization. The size of the decision making groups is an important element in collegial management. The model assumes that decisions are reached in consensus.

Political models embrace those theories that characterize the decision-making as a bargaining process. This model assumes that policy and decisions emerge through a process of negotiation and bargaining. The model tends to focus on group activity rather than the institution as a whole; concerns with interest and interest groups; stress the prevalence of conflict in organizations; assumes that the goals of organization are unstable, ambiguous, and contested; decisions within political arenas emerge after a



Philippine Normal University

The National Center for Teacher Education

complex process of bargaining and negotiation; the concept of power is central to all political theories.

Subjective models focus on individuals within the organization rather than the total institution or its subunits. This suggests that each member of the organization has a subjective and selective perception of the organization. This model assumes that organizations are the creation of the people within them. It focuses on beliefs and perceptions of individual member of organization rather than the institutional level or interest groups. It concerns with the meanings placed on events by people within the organization. It treats structure as product of human interaction rather than something that is fixed and predetermined.

Ambiguity models stress uncertainty and unpredictability in organization. These theories assume that organizational objectives are problematic and institution experience difficulty in ordering their priorities; lack of clarity about the goals of the organization; organizations have a problematic technology in that their processes are not properly understood; theories of this model argue that organizations are characterized by fragmentation and are considered as problematic; the model tend to be particularly appropriate for professional client- serving organizations; the theorists emphasize that there is fluid participation in the management of organizations. The ambiguity is provided by the signals emanating from the organizations' environment, unplanned decisions while this model stresses the advantage of decentralization.



Philippine Normal University

The National Center for Teacher Education

Cultural models emphasize the informal aspects of the organization rather than their official elements. They focus on the values, beliefs and norms of individuals in the organization and how these individual perceptions coalesce into shared organizational meanings; focus on the values and beliefs of members of organization; focus on the notion of a single or dominant culture in organization; emphasize the development of shared norms and meanings; the norms allow the development of a monoculture in a school with meaning throughout the staff.

Boleman and Deal (1997) identify four types of frames which serve as window on the world of leadership and management. The model is composed of structural frame, human resource frame, political frame, and symbolic frame.

The structural frame casts managers and leaders in the fundamental roles of clarifying goals, attending to the relationship between structure and environment, and developing a clearly defined structure appropriate to the needs to be done. The structural manager tries to design and implement process or structure appropriate to the problems and the circumstances. This clarifies the organizational goals, manages the external environment, develops a clear structure appropriate to task, and environment, clarifies line of authorities, focuses on task, facts, logic, not personality and emotions. This approach is useful when the goals and information are clear, when cause- effect relations are well understood, when technologies are strong and there is little conflict, low ambiguity, low uncertainty and stable legitimate authority.



Philippine Normal University

The National Center for Teacher Education

The human resource framework manager views people as the heart of any organization and attempts to be responsive to needs and goals to gain commitment and loyalty. The emphasis is on support and empowerment. The leaders empower people through participation and attempts to gain the resources people need to do a job well. This approach is appropriate when employee is high or increasing or when the employee morale is low or declining.

The political frame suggests that managers have to recognize the political reality of the organization and can deal with conflict. The job of the leader is to recognize major constituencies, develop ties to their leadership, and manage conflict as productively as possible. The leaders create arenas for negotiating differences and coming up with reasonable compromises.

The symbolic framework suggests that the most important part of a leader's job is inspiration- giving people something they can believe in. People will give loyalty to an organization that has a unique identify and makes them feel that what they do is really important. Effective symbolic leaders are passionate about making organization the best of its kind and communicating that passion to others. Symbolic leaders are sensitive to an organization's history and culture. They seek to use the best in an organization's traditions and values as a base for building a culture that has cohesiveness and meaning. They articulate a vision that communicates the organizations' unique capabilities and mission.



Philippine Normal University

The National Center for Teacher Education

The researcher acknowledged that the management of Science, Technology, and Engineering (STE) Program must accord to the over-all objectives of the program. All areas which are critical to the effective and successful management of the program must be given attention.

Conceptual Framework

Figure 2 presents the conceptual framework of the study. As shown in the figure, the status of the special science program involves the assessment of different components of the program which include management and leadership, curriculum management, student achievement, professional development, partnership building, financial management, support system, tracking of students, and monitoring and evaluation. The assessment of the components was done to determine the strengths and weaknesses in the implementation of the program. The results of assessment were used as bases in evolving a management framework which would enhance and give more clear directions for the effective, efficient, and successful implementation of the special science education program.

On Management

Management involves coordinating and overseeing the work activities of others so that their activities are completed efficiently and effectively. It ensures that work activities are completed efficiently and effectively by the people responsible for doing them, or at least that's what managers aspire to do (Robbins and Coulter, 2012).



Philippine Normal University

The National Center for Teacher Education

To manage means to bring, to accomplish, to have share of or responsibility for, to conduct. Management is the process of deciding what to do and then getting it done through the effective use of resources. They define goals, determine the resources- people, finance, work systems and technology- required to achieved goals, allocate those resources to opportunities and planned activities and ensure that those activities take place as planned in order to achieve predetermined objectives (Armstrong, 2009).

Sanchez (1996) opines that management is the process of developing people, and not the direction of things. It is a totality of process necessary to challenge people to aim for high purpose, to involve them significantly in planning and decision-making, and to help them develop effective working relationships among themselves that are satisfying and productive in accomplishing the aims of the system of which they are part. Further, management is getting things done through the unselfish efforts and cooperative undertaking of people working in an organization. He introduced 5 M's in management; the men, materials, machines, methods, and money. Likewise, he included directing, coordinating, budgeting and financing, mediating, and supervising in he called various functions of the school managers.

Schermerhorn and Chappell (2005) qualify that the success in management requires a capacity to recognize problems and opportunities in daily events, make good decisions, and take appropriate actions. The management processes which fulfill these responsibilities involve four functions namely; planning, organizing, leading, and controlling.



Philippine Normal University

The National Center for Teacher Education

Joshi (2012) added that an essential way of understanding the supervisory roles is to examine the functions or activities performed by supervisor in terms of planning, organizing, directing, and controlling.

Planning is a process of deciding exactly what one wants to accomplish and how to best go about it. It helps organizations to become better and better at what they are doing and to stay action oriented (Schermerhorn, 2005). It involves formulating policies, programs, and other major activities in order to achieve the goals of education. It stresses prevention rather than the correction of a mistake done by a unit (Sanchez, 1996).

As basic managerial function, it helps to determining the course of action to be followed for achieving various organizational objectives. It involves “thinking before doing”. It is a process of looking ahead. The primary objective of planning is to achieve better results.

The process of planning involves a number of steps; gathering information, laying down objectives, developing planning premises, examining alternative course of action, evaluation of action patterns, reviewing limitations, implementation of plans (Joshi, 2012).

Organizing typically follows planning and reflects how the organization tires to accomplish the plan. It involves the organizing of tasks, the groupings of tasks into departments, and the allocation of resources to department (Daft, 2000).



Philippine Normal University

The National Center for Teacher Education

The function of organizing is to arrange, guide, coordinate, direct and control the activities of the organization. It provides the necessary framework within which people associate for the attainment of objectives. It also includes designing jobs, designing organization, and training.

The process of organization involves (1) identifying the work to be performed, (2) classifying or group the task, (3) assign groups of activities or work to individuals, (4) organizing training, (5) delegating authority and fix responsibility, (6) coordinating these authority- responsibility relationships of various activities.

Leading is the use of influence to motivate employees to achieve the organizational goals. It means creating a shared culture and values, communicating goals to the employees throughout the organization and infusing employees with the desire to perform at a high level (Daft, 2000). Through leading, managers build commitments, encourage activities that support goals, and influence others to do their best work.

Controlling is the functions of making sure that performance conforms to plans. Control is essential for achieving objectives of an organization. The planning of various activities does not ensure automatic implementation of policies. Control is the process which enables management to get its policies implemented and take corrective action if performance is not according to the pre- determined standards. If planning is the beginning of the management process, controlling may be the final stage. If planning is



Philippine Normal University

The National Center for Teacher Education

looking ahead, controlling is looking. Control is not possible without planning and planning is meaningless without control.

Control is a live functions, and executives at various levels of management continuously assess the performance of their subordinates, controlling is conducted with people as well as with equipment and materials. Controlling involves (1) establishing standards of performance, (2) measuring actual performance, (3) comparing the actual performance with the standard, (4) finding variations or deviation, and (5) taking corrective action or measure.

On Leadership

Leithwood (2003) wrote that leadership involves setting direction, developing people so that they can head in the same direction, and redesigning the organization around instruction. He added the leaders also “have to help people figure out the shorter- term goals on the way to achieving the vision and then set high expectations for people in accomplishing those”.

To lead is to inspire, influence and guide. Leadership is the process of getting people to do their best to achieve a desired result. It involves developing and communicating a vision for the future, motivating people and gaining their engagement.

Leadership is a process of inspiring others to work hard to accomplish important task. Leadership matters (White, 2007) it requires native talent; develop abilities, and ephemeral but critical qualities of vision, inspiration, imagination,



Philippine Normal University

The National Center for Teacher Education

innovation, risk-taking, perspective, passion, excitement, and chemistry. The directions which the leaders set, the results they achieve, and the values and tone with which they imbue their organization have profound effect on the quality of our world and our individual lives.

In order for schools to become true learning organizations, they must put into place a formal leadership infrastructure that allows necessary improvements to be made from within the organization and to be supported outside the organization. A quality leadership infrastructure emphasize the prevention of problems as opposed to short term fixes or the covering up of problems, and focuses on the creation of a learning organization that encourages everyone to contribute to making school have a cumulative, purposeful effect on student learning. Before a meaningful and useful leadership infrastructure can be put into place, there must be agreed upon purpose for the school, an understanding of the values and beliefs about teaching and learning held by the individuals who make up the school, a mission, and a clearly defined vision shared by these individuals.

McEwan (2009) asserts that creating an effective school depends in hiring the right principal to improve the school along with strong support to carry- out the very difficult job in reinvigorating the school culture. The principals are the most important factor in improving the schools. They are responsible in communicating the mission, setting the agenda, determining what gets measured, and holding teachers and students accountable for accomplishing specific goals. Anderson (1997) concurs that the key



Philippine Normal University

The National Center for Teacher Education

factor to the school success is the building principals who set the tone as the school's educational leader, enforces positive, and convinces the students, parents, and teachers, that all students can learn and improve academically.

The greatest accountability of the school heads is to improve learning outcomes in schools. Rule VI section 6.2 of R.A 9155 states that the school heads have to be accountable for higher learning outcomes by setting the mission, vision, goals, and objectives of the school; creating an environment that is caring and welcoming for all students, and where teaching and learning will live; the implementing and monitoring of curriculum at the same time offering educational programs and services that will benefit all students.

Quinn (in Hemmen, Edmonson, and Slate, 2009) exerts that successful principal has always managed several roles. These roles included supporting the accomplishment for the organization goals, modeling teaching, learning and reflecting for students and teachers, supporting teachers as an instructional leader, supporting the change process, developing a system of learning as a group, and developing and conducting staff development to improve the rigor of instruction.

The roles of the leaders require a wide array of skills which include managerial, technical, and social skills. Schmoker and Wilson (1993) present the Deming's management philosophy which explicates and amplifies fourteen (14) points in managing organization which includes (1) create constancy of purpose toward improvement of product and service, (2) adopt a new philosophy, (3) cease dependence



Philippine Normal University

The National Center for Teacher Education

on mass inspection, (4) end the practice of awarding business on the basis of price tag alone, (5) improve constantly and forever the system of production and service, (6) institute training, (7) institute leadership, (8) drive out fear, (9) break down barriers between staff areas, (10) eliminate slogans, exhortations, and targets for the workplace, (11) eliminate numerical quotas or targets the workplace, (12) remove barriers to pride of workmanship, (13) encourage education and self- improvement for everyone, and (14) put everybody in the company to work to accomplish the transformation. When this management philosophy is being applied for school improvement, it would prevail a democratic, collegial atmosphere, threat will be eliminated and would encourage continuous improvement and recognize and use the expertise of the employees, employees become obsessed in the improvement.

Curriculum Management

The term curriculum refers to the sum total of the organized learning stated as educational ends, school subjects, activities performed inside the classroom and in the immediate school surrounding, and / or topics decided upon and provided within the educational institution for the attainment of all the learners under the effective leadership of the school officials and specifically, the teachers (Sanchez, 1996).

Wiles and Bondi (2007) define curriculum represents a set of desired goals or values that are activated through a development process and culminate in successful learning experiences for students.



Philippine Normal University

The National Center for Teacher Education

Curriculum development is the essential function of school leadership. The curriculum leader follows a deductive process to give more and more definition to the program. They help the school community and the teachers provide a highly detailed definition of what is intended for students. This includes goals, objectives, standards, programs, contentment and even lesson planning.

In all school, staff development programs can help connect curriculum plans with classroom instruction. Assessing students' achievement identifies some learning skills that are not being taught well. Once a weak area of the curriculum is identified, the curriculum leader can schedule training sessions to improve faculty knowledge in those areas.

School officials concerned to take note of the principles in the development of a curriculum: the curriculum should provide for a grouping of the commonly accepted subjects. It should aim to promote the correction of related subjects for effective learning; the school officials and teachers should go about the task of organizing the curriculum in accordance with the established policies in the Philippines; the organized curriculum should not remain fixed and inflexible. It should grow; it should continuously evolve, and should systematically evaluated (Sanchez, 1996).

On the other hand, the curriculum contains (1) curricular policies which designate the set of rules, criteria, and guidelines intended to control curriculum development and implementation; (2) Curricular Goals are the long- term educational outcomes that the school system expects to achieve through its curriculum. The goals



Philippine Normal University

The National Center for Teacher Education

are the outcomes the school system hopes to achieve through its curriculum; (3) field study which is the organized and clearly demarcated set of learning experiences typically offered over a multilayer period; (4) program of study that is the total set of learning experiences offered by a school for a particular group of learners. This is often described in a policy statement that delineates which subjects are required and which are electives, with corresponding time allocations and credits; (5) the course of study is a set of organized learning experiences, within a field of study, offered over a specified period of time.

Students' Achievement

In the increasing level of accountability, Tillman (2005) reiterates that the academic success of students lies on the roles of the principals. The focus of school improvement is on creating a comprehensive learning organization that understands, cares about, and works for students. A focus on students causes leadership to move teachers from providers' impact of their actions on students and student achievement, and change students from recipient of knowledge delivery to goal setting, self-assessor who produces independent, quality products.

In school where students and students' learning are clearly the focus, essential learning is known, teachers collaborate and are skilled in action research, in knowing, predicting, and acting on the impact of their actions to increase student achievement. Until the teachers are able to predict the impact of their actions based on these predictions, corroborate the effect of their actions with students, and work with



Philippine Normal University

The National Center for Teacher Education

peers to build a comprehensive learning organization, any increase in student achievement and changes in the classroom will be temporary.

A true learning organization will understand its student population. It will know who the students are- ethnically, socially, emotionally- what they value and believe, how they like school and learning, and what the impact of the current processes are on their learning.

The most important element in understanding and increasing students' achievement are derived from the school mission and vision, curriculum, norms and the culture of the school. Essential learning provide standards by which the school evaluates its success, statement of what the school wants its graduates to know, to do, and to be like as they leave the school. They are used to determine what will best prepare the students for the future and to shape the future. Identifying essential learning is critical to building a continuum of learning that makes sense for preparing students for the world they will face when they are on their own. Essential students' learning drives the assessment, curriculum, and instructional.

When essential student learning is known, teachers can design a continuum of learning for students; articulate curriculum across grade levels and age groups, ensure basic skills attainment for all students, and coverage of curriculum frameworks. Essential students' learning is derived from a future context. All stakeholders must be involved in deriving the essential students' learning, which must reflect the shared mission, values, beliefs, and vision of the school. School must start by identifying



Philippine Normal University

The National Center for Teacher Education

essential learning upon existing the system and work backward to translate the learning into standards and actions at all levels of the school.

According to Deming, using the identified essential students' learning, school staff must determine the processes critical to ensure that all students at all levels leave the school having mastered the learning. In order to meet the needs of specific groups of students, and to have them achieve essential student learning, the school must become aware of developments in assessment, instructional strategies, and technology. From the learning, the curriculum and instructional and assessment strategies are formed. The essential learning statements and assessment should become one and the same, and from these statements, the instructional strategies become apparent. Assessment must assess what is taught and what is taught is what is assessed.

Professional Development

Goldberg (2001) revealed that staff development is one of the most important aspects of any approach to improvement in education. Changes in school organization, laws and regulations, intervention strategies, curriculum development, teaching methods, safety, technology, and other areas occur far too rapidly for any teacher to keep pace alone.

In the area of education, teachers can pursue formal degrees and other coursework in their subject area of choice. School districts also develop their own priorities regarding where the development should occur. If all K- 12 teachers need to



Philippine Normal University

The National Center for Teacher Education

know more about approaches to reading; or if all teachers need training in core knowledge materials; or if any category of teachers requires instruction in rubrics, constructivism, cooperative learning, or new local or state educational standards, staff development is the method of choice. A common venue for such development is in-service training.

Berhardt (2007) and Reeves (2005) argued professional development is vital to facilitating the use of data-driven decision making and recommended school leaders ensure professional development instigates instructional change. A strong focus on increasing student achievement should be present in the planning of professional development (Kowalski et. al; Schmoker, 2004). Providing teachers with an ongoing practice in a supported environment helps to improve their competency with analyzing data and making decision that possibly impact student achievement (Pulliam, 2005).

Recommendations for staff development (1) engage groups, not individuals; (2) limit staff development priorities; (3) determine the reasonable method for prioritizing; (4) have a four year plan; (5) maintain a constant public focus; (6) send teachers to state or national conferences; (7) subscribe for educational journals; (8) take advantage of technology; (9) make the most of the media budget; (10) promote leadership visibility; (11) integrate priorities into the daily life of the school or the system; and (12) don't leave the parents out.



Philippine Normal University

The National Center for Teacher Education

Partnership Building

Schools that seek to prepare students to live and work in the information age do well to establish partnership with business, the community, and parents. These partnerships can make instructional programs exciting and relevant to the purpose of developing students into successful citizens and quality workers. Partnership help to reinforce learning at home and by providing solution to some of the problems teachers face when trying to teach children who are not prepared to learn.

Effective partnership with parents, business, and community can help ensure that students' basic needs are met and they are able to learn meaningful information. Partnership can provide schools with information to guide curriculum and instruction, and can help schools to set priorities and achieve goals. Business, community, and parents are all clients of school. Involving clients in the continuous improvement of the products enable schools to make use of talents, resources, and advice from people who have a vested interest.

To create and maintain successful partnerships, school must clear about what they want partnerships, what they want the partnerships to accomplish, and what the partners will get out of partnership. Answers to these questions are needed in order to construct effective win- win partnership.

School partnership with business typically range from businesses giving products and services to schools all the way businesses providing students, teachers, and



Philippine Normal University

The National Center for Teacher Education

administrators with skill building experiences in the business site. Business can help students to understand why they need to know the information they are learning in school, and how the knowledge is applied in a real job situation.

There is evidence that parent involvement leads to increase student achievement. The key increasing the amount of quality of parent involvement and to establishing ongoing partnership with parent is to help the parent understand what they can do to make a difference and to allow them to contribute in meaningful ways. Teachers must take an active role to encourage and motivate parents to get involved in educating their children. Teachers and other school staff members must communicate often and regularly with the parents. Teachers may choose to increase communication with parents through notes, newsletters, narratives, telephone calls, and parent conference.

In working to increase parent involvement and participation school must acknowledge the fact that many parents work or have small children at home. Parents input are extremely valuable and communication crucial as school engage in extensive school improvement efforts. Parents are stakeholders who represent different point of views than those held by typical educators. Their opinions about how to “educate” students need to be heard and they need to be kept informed along the way changes are made.

Partnerships with community service organizations can help school project a positive public image and can give students experience providing service to community.



Philippine Normal University

The National Center for Teacher Education

Schools must not wait to be invited to be part of the service community; they need to approach potential community partners with positive win-win proposition. Schools can interest organization in community to become partners by the school volunteering first to provide services to the organization that at the same time support essential student leanings.

Financial Management

Financial management involves determination of the requirement for funds, making funds available, at the least cost and seeing to it that funds are being used as planned so as to optimize operations and increase the value of the business itself. It is a use of financial statements that reflects the financial conducts of a business to identify its relative strengths and weaknesses. It enables the managers to plan using projections, future financial performance per capita, assets and personnel requirements to maximize the return of shareholders or the ease of the cooperative, and investment (Paule, 2004).

The national government is, in principle, responsible for the provision of education to all children within its territory. The development of budget and management of finances in education is a principal responsibility of the education and finance ministries. Educational authorities must seek involvement in education funding decisions in order to ensure that resources are used in the interests of all learners, and in order to minimize unintended consequences on the national education system (UNESCO, 2006).



Philippine Normal University

The National Center for Teacher Education

In addition, the final element of the financial management is that of the analysis of budgetary expenditure, used to help educational planners better understanding in what ways the allocation of funds has helped or hindered the realization of educational policy. Traditional budget can give a comprehensive understanding of the educational objectives and activities, depending on what budgeting techniques are used. An analysis allows planners to determine whether or not these objectives have been attained.

UNESCO (2006) offers strategies in the financial management which includes; when the country has been affected by an emergency, special attention should be paid to strengthen the education ministry capacity for budgeting and financial management in order to cope with the demands of emergency response and subsequent reconstruction; coordinate donor resources and educational provision; assess available resources and prioritize allocation of finances based on need assessments; plan financing in light of the special consideration associated with the emergency conditions and link support to long- term plans; mobilize additional resources to meet key financial keys; monitor implementation of all expenditures to ensure accountability and transparency; and review expenditures based on issues of equity and sustainability.

The Ministry of Education in Southern Africa (2000) asserts that the core business of school is teaching and learning. The major role of the educational manger is to create an environment in the school that will facilitate effective and successful teaching and learning. This is done through effective management of the school's



Philippine Normal University

The National Center for Teacher Education

human, material and financial resources. Financial management therefore, is an integral part of responsibility of the school managers because without good financial management practices, schools would find it difficult to achieve their goals. As Drake and Roe (1994) confirms that “the efficiency and effective management of fiscal and physical resources can enhance instructional program”.

Financial management covers the procurement of funds, their allocation, monitoring their use in the interest of accountability and producing financial reports for the relevant stakeholders. Effective management ensures that: all financial regulations and procedures are complied with; all financial transactions are recorded accurately; adequate control are in place to ensure that expenditures do not exceed income; and only authorized expenditures are incurred.

Brent and Finnigan (2008) share the financial management in New York Charter Schools involves practices related to (1) generating resources, (2) allocating resources, (3) managing and reporting financial information, (4) safeguarding resources, and (5) managing specific functional areas.

Hough (1993) extracts several points in the financial management in education. He contends that financial management in education applies both at the level of an education authority and at the level of individual schools and college; it must therefore include mechanisms through which the education authority allocates funds and resources to individual institution.



Philippine Normal University

The National Center for Teacher Education

Financial management in education is an integral part of general educational management which embraces curriculum, staffing and timetable decision. All of which relate directly to the essential function of the educational institution, and also essential non- instructional activities; the meaning of financial management vary in different educational systems depending on the degree of financial autonomy granted to the education authority and by the educational authority to individual schools and colleges.

Student Support

The Department of Education mandates all educational institutions to establish, maintain, and support a complete, adequate and integrated system of basic education relevant to the needs of the people and society in lieu to the protection and promotion of the rights of all citizens to quality basic education.

The purposes and objectives of Republic Act No. 9155 otherwise known as the Governance of Basic Education Act of 2001 include the (1) development of framework for the governance for basic education which shall set the general directions for educational policies and standards and establish authority, accountability, and responsibility for achieving higher learning outcomes. (2) Ensuring that school and learning centers receive the kind of focused attention they deserve and the kind of educational programs, projects and services they need taking into account the interest of the all members of the community. In addition, the establishment of schools and learning centers, and other school facilities where school children are able to learn range of core competencies prescribed for elementary and high school programs or where the out- of –



Philippine Normal University

The National Center for Teacher Education

school youth and adult learners are provided alternative learning programs and receive accreditation for at least the equivalent of an elementary or a high school education.

Danielson (2002) noted that the school learning support system provide extra assistance to students who need it to make satisfactory progress in their learning. The system is safety net for students, preventing them from falling through the cracks of the school program; it should not permit any student to fail.

Tracking of Students

Tracking is the practice of sorting students by academic ability level for all classes. Through various assessments, students are usually labeled as above average, average, or below average. Throughout history, students tracking has caused constant discussion and debate among educators, students, parents and researches in education filed (Melendez, 2012).

According to Oakes (2005) tracking emerges as a solution to a specific set of educational and social problems. Tracking became popular when both educational and social forces weighed heavily on schools, which led to dramatic alterations in the quality and quantity of secondary schooling. Schools began to use tracking in order to “sort and select” students that would most likely be attending an institution of higher education. Opportunity and exposure to the different tracks continue to shape student’s educational experience. These opportunities create boundaries for these students which have important implications for a student’s future.



Philippine Normal University

The National Center for Teacher Education

Betts (2011) opined that tracking refers to the tendency in many countries' public school systems to divide students by ability. He argues that proponents of tracking viewed that tracking is economically efficient to group students by ability and perhaps by students' academic interests. By creating more homogenous classrooms, in theory educators could tailor their pedagogical approaches for the given set of students. Separating students by initial achievement also opens up the possibility that school systems could tailor school resources to the given type of students.

On the other hand, opponent of tracking argue that it condemns students placed into the lower tracks to lower educational attainment, and therefore lower earnings in their adult years. They fear that tracking aggravates economic inequality and perpetuates economic disadvantage across generations.

Marzano (2007) concurs that tracking of student progress allows both the teachers and students to examine increase in knowledge toward the learning goals. It helps the students and teachers identify and link progress to determine the next steps for their actions. He further presented that tracking of students' progress allows students and teachers to see the progress made and how it relates to behavior and academic success. In this sense, students are able to set personal learning goals and become more responsible of their learning. They are also able to see that assessment are not just isolated occurrences, but connected to the learning goals and learning progress being made. Teachers on the other hand, are able to quickly assess progress and made adjustment instruction.



Philippine Normal University

The National Center for Teacher Education

Fullan (2001) coincides that teachers are changed agents and facilitators and designers of learning and students do more than learning- they bring the learning issued to the collectivity. As John Hattie puts it, that teachers need to be changed agents, a facilitator of learning, and that teacher talk and teacher direction needs to be less overt.

Monitoring and Evaluation

Monitoring is the final stage in the management process which is closely related to evaluation and assessment. Robbins and Coulter (2005) define monitoring as management's critical action to ensure that organizational activities are being accomplished as planned. Hence, the main attempt in the monitoring phase is to correct any disorders which prevent the organization from achieving its desired goal. Importantly, managers would be unable to know if the organization is performing correctly as planned unless they enforce the monitoring and evaluation process. Continuous monitoring is the perfect approach for management to prevent any possible problems in future. Moreover, the monitoring function will help management to identify problems in the early stages, hence to control them and avoid possible chaos. Therefore, even if the organization is performing accurately all managers should be concerned with the control function (Robbins & Coulter, 2005).

Bateman and Snell (2007) emphasized the essential role of controlling in enhancing organizational performance; they suggested that the main criterion for success is to determine how well the monitoring function has facilitated goal achievement. This is because monitoring is the process that guarantees organizational plans are being



Philippine Normal University

The National Center for Teacher Education

implemented accurately. No doubt managers who get more help and cooperation will be more successful in their monitoring task.

The evaluation task may characterize as helper and advisor to program planner and developers. During the early stages of the program operations, the evaluator describes and monitors the program activities, to test periodically for progress toward achievement or attitude change, to look for potential problems, and to identify areas where the program needs to be augmented, modified, or improved.

Evaluation gives direction to the changes and improvement in the implementation of school program. It is a process used to identify student needs. It is the process used to set priorities among needs and to translate needs into program objectives or modifications of existing objectives. It is the process used to identify and to select among different program approaches, organizations, staff assignments, materials and equipment, facilities, schedules, and other structuring choices in order to build a program that has a high likelihood of success. It is a process used to monitor and adjust programs as they are implemented. It is the process used to determine whether program is resulting in desired outcomes and why the outcomes are as they are. It is the process used by outsiders to determine whether the program should be supported, changed, or terminated. It is the process used to judge requests for resources to support the program. In short, evaluation is an essential part of the improvement of school programs. It underlies all the changes and reforms.



Philippine Normal University

The National Center for Teacher Education

The payoffs of program evaluation are benefits to school staff and the children they serve. as a result of sound program evaluation, benefits that can accrue to students might include improvement of educational practices and procedures or development of support materials to eliminate curricular weaknesses.

Benefits to teachers might include recognition and support for teachers and help in choosing the best curriculum materials. Benefits to principals might include direction in setting priorities for school improvement or the identification and justification of needs for new programs (Sanders, 2000).

The concepts presented provide insights to the researcher that the effective and successful implementation of science and mathematics program heavily depends on the collaboration between the school heads and stakeholders who work together to effectively manage the different components of the program in holistic approach. The continuous assessment in the status of the program would determine how the program is being implemented and the results would become inputs to achieve the objectives of the program.

In addition, managing the Science, Technology, and Engineering (STE) Program requires deep understanding about the objectives of the program. The management should not be left on the hands of the school heads alone but rather, everyone must be involved in the implementation and management of the program. Teachers who are involved in the implementation and management of the program must be aware on their responsibilities how the objective of the program will be attained.



Philippine Normal University

The National Center for Teacher Education

Everyone should work in common direction and provide an open communication so that objectives of the program will be properly communicated to all. Lastly, the performance must be measured to determine if the objectives are attained.

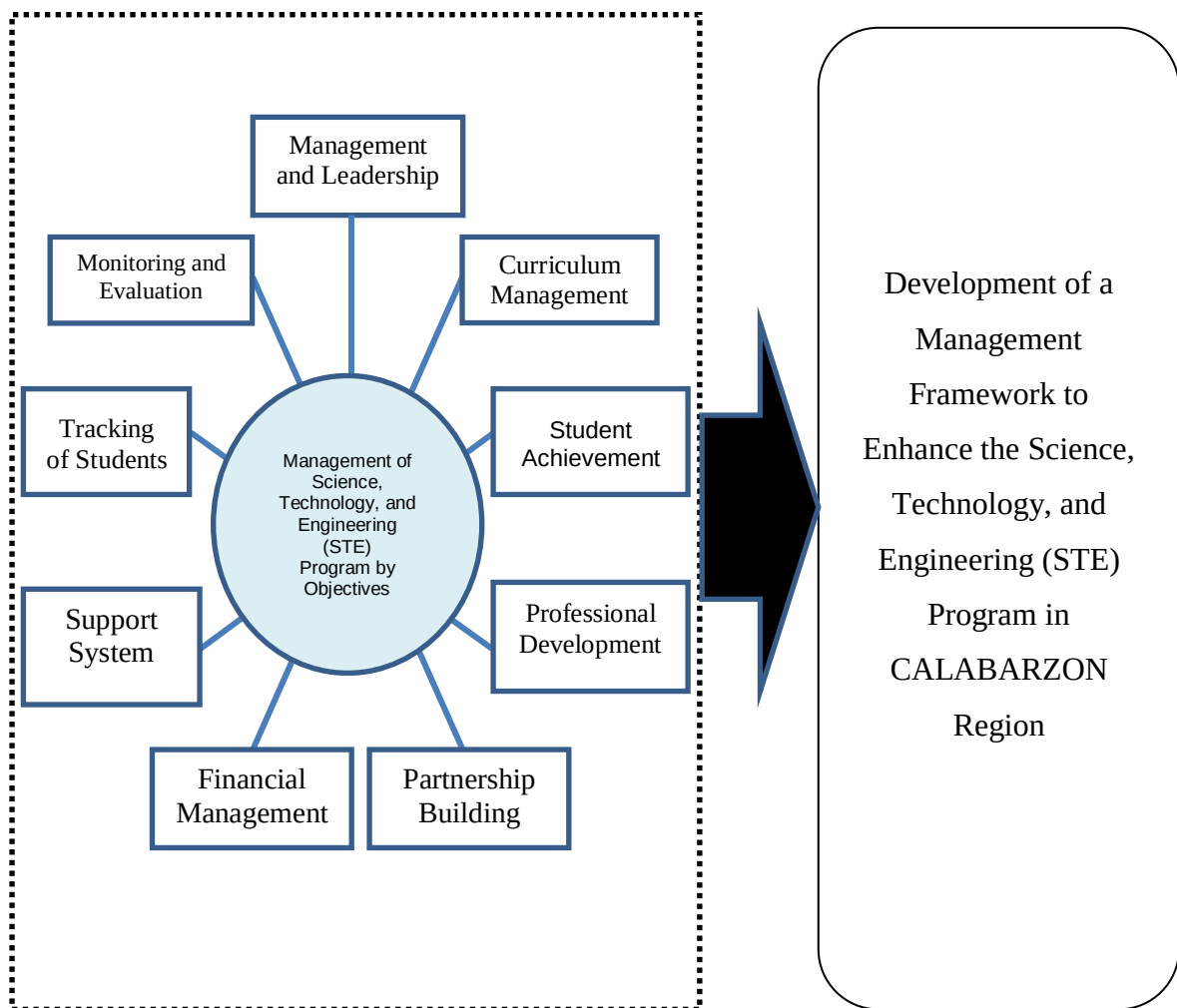


Figure 1. Conceptual Framework of the Study



Philippine Normal University

The National Center for Teacher Education

Statement of the Problem

This study aimed to assess the status of implementation of Science, Technology, and Engineering (STE) Program among the secondary schools in CALABARZON Region.

Specifically, the study sought answers the following questions:

1. What is the status of implementation in the management of the Science, Technology, and Engineering (STE) Program in the CALABARZON region as perceived by school heads, head teachers, master teachers, and teachers, in the following areas:

- 1.1. Management and Leadership;
- 1.2. Curriculum Management;
- 1.3. Student Achievement;
- 1.4. Professional Development;
- 1.5. Partnership Building;
- 1.6. Financial Management;
- 1.7. Support system;
- 1.8. Tracking of students; and
- 1.9. Monitoring and Evaluation?

1.1. What are the strengths and weaknesses of the program across assessment of each group of respondents in the above cited areas?



Philippine Normal University

The National Center for Teacher Education

2. Based on the findings of the study, what management framework can be developed to enhance the implementation of Science, Technology, and Engineering (STE) Program in CALABARZON Region?

Significance of the Study

Amidst the reforms made in the Philippines to improve the quality of education, it is timely that the different educational programs implemented by the Department of Education be assessed so that the status of its implementation will be given a value. It is indeed, imperative to take actions which elevate the management of the program through management framework which serves as guide in the implementation and achievement of the objectives of the program. Considering the importance of the study, hence it is found beneficial to the following:

For DepEd in-charge of the program. The identified weaknesses and strengths in the implementation of the program in specifically in CALABARZON region would provide an avenue to look at the effectiveness and viability in the implementation of the program so that appropriate course of actions will be made. The framework which aimed to enhance the management of the program would provide another perspective on how the program will be effectively managed.

School heads in the schools implementing the program. Since there are new public secondary schools in the CALABARZON region offering the special science program, hence they can benchmark on the practices of the five original schools for



Philippine Normal University

The National Center for Teacher Education

the effective implementation of the program. The school heads of the newly recognize schools offering the program can adapt the leadership and management styles of the schools heads so that they will be guided on how the objectives of the program will be met. The management framework would provide them basis on how the program would be effectively and efficiently managed.

Science and Mathematics teachers involved in the program. The awareness on the performance of their students in the program would lead them to revisit their teaching performance so that their students will succeed in the program. The strengths and weaknesses in the performance of the students will be an avenue in revisiting their teaching competence and commitment for them to realize that their roles as teachers in the program are critical to the academic success of the students and at the same time to the proper implementation of the program.

For the parents. The findings and identified weaknesses especially in partnership building would give awareness to the parents about the status of the program. They will be informed that their roles in relation to growth and performance of their students are important and hence, they can give their insights and feedback about the program.

For the future researchers. The findings of the study will serve as a springboard of other researchers who are also interested in studying the special science program. They may also verify the accuracy of the findings.



Philippine Normal University

The National Center for Teacher Education

Scope and Delimitation of the Study

The study looked into the status of implementation of the Science, Technology, and Engineering (STE) Program in the implementing public secondary schools in CALABARZON Region. A quantitative method of research was employed to assess and identify the strengths and weaknesses of the program along the nine (9) areas identified in the study; management and leadership, curriculum management, student achievement, professional development, partnership development, financial management, support system, tracking of students and monitoring and evaluation.

The secondary schools offering the special science program were those identified by the Department of Education (DepEd), Science Education Institute (SEI), and the Department of Science and Technology (DOST) in the CALABARZON Region namely; Batangas National High School, Bucal National High School, Lipa City Science High School, Pedro Guevarra Memorial High School, and Quezon National High School. These schools are the pilot schools implementing the special science program since 1993.

The respondents of the study were selected purposively and only those who are directly involved in the implementation of the special science program. They are the school heads, head teachers, master teachers, science and mathematics teachers.



Philippine Normal University

The National Center for Teacher Education

A survey questionnaire and semi- structured interview guide were the instruments used in gathering information from the identified groups of respondents. A semi- structured interview was used to support the findings of the survey but did not attempt to explain the underlying reasons for such result (Chua, 2013). The responses in the questionnaire were tallied and analyzed using statistical treatment. Strengths and weaknesses in the components were also determined. The results of the data were used as basis in designing a management framework to enhance the implementation of the Science, Technology, and Engineering (STE) Program in CALABARZON Region.

Definition of Terms

The following terms have been defined either conceptually or operationally or both depending upon how each was used in the study.

CALABARZON Region. This refers to the provinces covering the Region IV-A. The five original public secondary schools where the study was conducted belong in this region.

Controlling. It concerns with monitoring employees' activities, keeping the organization on track toward its goals, and making corrections as needed (Daft, 2000). In this study, it refers to the approaches used by the school heads in the special science high school so that proper implementation of the program will be achieved.



Philippine Normal University

The National Center for Teacher Education

Curriculum Management. In this study, it refers to the practices of the school heads and teachers implementing the special science high schools in order to attain the desired goals or values. It is done through a development process and culminate in successful learning experience for students. It also identifies the strategies and approaches used by teachers to help the students perform better.

Evaluation. It is a systematic and objective assessment of an on-going or completed policy, programme or project, its design, implementation and results. The aim is to provide timely assessments of the relevance, efficiency, effectiveness, impact and sustainability of interventions and overall progress against original objectives (Goyder and Marriott, 2009). In this study, it concerns on how the implementing schools evaluate the program and how the results of evaluation are used to enhance the implementation of the program.

Financial Management. It involves financial planning and budgeting, financial accounting, financial analysis, financial decision- making and action (Shapiro, 1995). It includes reviewing, forecasting, budget control and monitoring (Hart, 1993). In this study, it refers on the processes observed by the schools in allocating and managing the fund allocated for the implementation and the achievement of the objectives of the program.

Leading. It refers to the management functions that involve the use of influence to motivate employees to achieve the organization's goals (Daft, 2000). In this study, it



Philippine Normal University

The National Center for Teacher Education

refers to how the school heads in the special science high schools enthusiastically motivate the teachers in achieving the objectives of the program.

Leadership. It involves a social influence process whereby intentional influence is exerted by one person (or group) over other people (or groups) to structure the activities and relationships in a group or organization (Yukl, 2002). In this study, it refers to the influence exerted by the school heads of the special science high school to the teachers in attaining the objectives of the program.

Management. It refers to the attainment of organizational goals in an effective and efficient manner through planning, organizing, leading and controlling organizational resources (Daft, 2000). In this study, special science program was assessed to determine the strengths and weaknesses in the management of the program. The results of assessment were used as basis in developing a management framework which aim to enhance the STE Program.

Management Framework. In this study, it refers to the output as a result of assessment done in the implementation of the special science program. This management framework offers new interrelated theories/ concepts that back up the findings of the study.

Monitoring. It is an on-going function that employs the systematic collection of data related to specified indicators. It provides management and the main stakeholders of a development intervention with indications of the extent of progress



Philippine Normal University

The National Center for Teacher Education

and achievement of expected results and progress with respect to the use of allocated funds. Monitoring provides an early indication of the likelihood that expected results will be attained, as well as an opportunity for validating programme theory and logic, and making the necessary changes in programme activities and approaches. Monitoring provides essential inputs for evaluation and therefore constitutes part of the overall evaluation process (Goyder and Marriott, 2009). In this study, it assesses how the five original secondary schools implementing the program take measures in monitoring the program and how they use the result of the monitoring in making sound decisions in the implementation of the program.

Organizing. A management functions concerned with assigning tasks, grouping task into department, and allocating resources to department (Daft, 2000).

Partnership Building. This refers to the understanding the purposes of, approaches to, and planning for educational partnerships with business and community groups, parents, other educational professionals, and students.

Planning. It refers to a process of deciding exactly what one wants to accomplish and how to best go about it. It helps organizations to become better and better at what they are doing and to stay action oriented (Schermerhorn, 2005). It concerns with defining goals for further organizational performance and deciding on the tasks and resources used needed to attain those (Daft, 2000). It involves formulating policies, programs, and other major activities in order to achieve the goals of education. It stresses prevention rather than the correction of a mistake done by a



Philippine Normal University

The National Center for Teacher Education

unit (Sanchez, 1996). In this study, it refers on how the schools implementing the special science program strategically plans in order to achieve the objectives of the program.

Professional Development- It provides individuals with opportunities to improve their personal performance on a continuous basis and to learn new skills for working with each other in reforming their culture and workplace. This assists schools in thinking through and planning for appropriate professional development activities that will help them reach their school's vision.

Program Assessment. It refers to a systematic and ongoing method of gathering, analyzing, and using information from various sources about a program and measuring program outcomes in order to improve student learning (Huba and Freed et.al, 2000). In this study it pertains to the assessment in the status of implementation of the special science program in CALABARZON Region.

Science, Technology, and Engineering Program. This refers to an intervention program meant to upgrade the Engineering and Science Education in the country (Ogena, 1998). A science and mathematics-oriented curriculum devised for high schools in the Philippines which is offered by specialized high schools supervised by the Department of Education. In this study, the status the implementation of the program was assessed to surface the strengths and weaknesses in the implementation of the program.



Philippine Normal University

The National Center for Teacher Education

Student Achievement. In this study, it refers to the strategies employed by the schools implementing the program in monitoring and measures employed by the schools in helping students succeed in the program.

Support System. In this study, it refers to the availability of the services which facilitates and supports the learning of the students enrolled in the program like the library, guidance office, science laboratory, computer laboratory, and research center.

Tracking of Students. In this study, it refers to the measures and approaches used by the schools in generating feedback and information about the status of students in the program.



Philippine Normal University

The National Center for Teacher Education

Chapter II

REVIEW OF RELATED LITERATURE

This chapter presents the literature review and studies organized into several components. The discussion focuses on the key concepts relevant to program assessment and its historical background, the science education program, school management and leadership and its significance in putting direction for the improvement of the school and in managing educational programs. Likewise, the Curriculum Management, Student Achievement, Professional Development, Partnership Building, Financial Management, Support System, Tracking of Students, and Monitoring and Evaluation are also presented to show how their relationship to the study.

Program Assessment

Program assessment is a systematic and ongoing method of gathering, analyzing, and using information from various sources about a program and measuring program outcomes in order to improve student learning. This is done through obtaining a good understanding of what the program's graduates know, what they can do with this knowledge, and what they value as a result of this knowledge (Huba and Freed, 2000; Hutchings and Marchese, 1990; and Palomba and Banta, 1999).



Philippine Normal University

The National Center for Teacher Education

Similarly, the University of Central Florida Academic Program Assessment Handbook (2008) presented the four main purposes of program assessment. These include:

1. To improve- the assessment process should provide feedback to determine how the program can be improved.
2. To inform- the assessment process should inform faculty and other decision- makers of the contributions and impact of the program.
3. To prove- the assessment process should encapsulate and demonstrate to students, faculty, staff and outsiders what the program is accomplishing.
4. To support- the assessment process should provide support for campus decision- making activities such as program review and strategic planning, as well as external accountability activities such as accreditation.

In addition, the task force team from American Association for Higher Education developed nine principles of assessment. These include:

1. The assessment of student learning begins with educational values.
2. Assessment is most effective when it reflects an understanding of learning as multidimensional, integrated, and revealed in performance over time.
3. Assessment works best when the programs it seeks to improve have clear, explicitly stated purposes.



Philippine Normal University

The National Center for Teacher Education

4. Assessment requires attention to outcomes but also and equally to the experiences that lead to those outcomes.
5. Assessment works best when it is on-going, not episodic.
6. Assessment fosters wider improvement when representatives from across the educational community are involved.
7. Assessment makes a difference when it begins with issues of use and illuminates questions that people really care about.
8. Assessment is more likely to lead to improvement when it is part of a larger set of conditions that promote change.
9. Through assessment, educators meet responsibilities to students and to the public.

Conducting a program assessment is a systematic, ongoing process that uses the results from measured outcomes to improve the implementation of the program. In order to improve the educational program, it is logical to determine the status of the program being assessed, its present status and its future direction. This requires an articulation of the program's mission, vision, goals, and objectives or outcomes. Given this, immediate actions toward the achievement of the program VIMIGO are hence appropriate. This of course, includes analyzing the implementation of the program to determine the needed approaches and strategies which will become the basis in planning and appropriate actions.



Philippine Normal University

The National Center for Teacher Education

Alber et. Al (2008) addressed some misconceptions concerning about program assessment when they clarified that the primary purpose of assessment is to identify the important objectives and learning outcomes for the program with the purpose of improving students learning. They added that, anything that enhances and improves the learning, knowledge and growth of the students cannot be considered a waste of time. In the same thought, they concur that for the program to be successful, it must be an ongoing and continuous process. The assessment plan should be continuously reviewed and improved. The results of the program assessment are used to improve programs.

King et al. (1987) shared that the assessment of program implementation provides a rationale for describing program implementation; help to plan an implementation evaluation that is both workable and useful to decision makers; and guides in designing instruments to produce supporting data to produce accurate description to the audience.

The National Science Teachers Association (NSTA) provides national and international leadership in science education by identifying the qualities and standards for good science education which are set forth in the position statements which are used to support the improvement of science education at all levels. It outlines fifteen systemic elements of high quality science programs; goals, district supervision, complete curriculum, resources allocation, leadership, instruction,



Philippine Normal University

The National Center for Teacher Education

materials management, classroom culture, professional development, equitable access, student assessment, driven decision making, and results.

Magno (2010) presents the history of educational assessment as described by the different pillars that contribute to its development.

Formal Assessment in the Philippines started as a mandate from the government to look into the educational status of the country (Elevazo, 1968). The first assessment was conducted through a survey authorized by the Philippine legislature in 1925. The legislature created the Board of Educational Survey headed by Paul Monroe, and later, this board appointed an Educational Survey Commission who was also headed by Paul Monroe. This commission visited different schools in the Philippines. The commission observed different activities conducted in schools around the Philippines. The results of the survey reported the following:

1. The public school system that is highly centralized in administration needs to be humanized and made less mechanical.
2. Textbook and materials need to be adapted to Philippine life.
3. The secondary education did not prepare for life and recommended training in agriculture, commerce, and industry.
4. The standards of the University of the Philippines were high and should be maintained by freeing the university from political interference.
5. Higher education is concentrated in Manila.



Philippine Normal University

The National Center for Teacher Education

6. English as medium of instruction was best. The use of local dialect in teaching character education was suggested.
7. Almost all teachers (95%) were not professionally trained for teaching.
8. Private schools except under the religious groups were found to be unsatisfactory.

In 1960, the National Economic Council and the International Cooperation Administration surveyed public schools. The survey was headed by Vitaliano Bernardino, Pedro Guiang, and J. Chester Swanson. Three recommendations were provided to public schools: (1) to improve the quality of educational services, (2) To expand the educational services, and (3) to provide better financing for the schools. The assessment conducted in the early years were mostly mandated and/or commissioned by the government. The private sectors were not included in the studies as proponents. Most of these studies are usually headed by foreign counterparts such as the UNESCO, Monroe, and Swanson survey.

The focus of the assessments was on the implementation of education in the country. These national researches were conducted with the need of the government to determine the status of the education in the country.

The assessment of the special science in the Philippines was conducted by Dr. Ibe, the project consultant of the Engineering and Science Education Project (ESEP), on the performance of the Special Science Classes (SSC) in 110 S &T-Oriented High Schools along Science, Mathematics, and English during the school



Philippine Normal University

The National Center for Teacher Education

year 1993- 1994 to 19978- 1998. The measure of assessment focused on the Mean Percentage Scores (MPS) of the academic achievement test result of the students in special science class. Accordingly, one way to determine the impact of the program is to look into the achievement levels of the students under the program and the general approach was to administer achievement test to the students under the special science curriculum or the special science classes as well as to comparison groups consisting of the brightest and the best students from the regular classes.

Findings of the study revealed that the students in SSC consistently performed better in Mathematics, Science, and English than the best students in the RC. This led to the conclusion that the special science curriculum and other educational interventions significantly enhanced the performance of students in special science class as indicated by the higher scores in the achievement test.

Similarly, Ogena et.al (2010) assessed the performance of Filipino students under the Science High Schools that participated in the 2008 TIMMS- advanced. Analysis of results showed that compared to other countries, performance of students from the Philippines is relatively less. This results into conclusion that evaluation of Science, Mathematics, and Engineering through international assessment test are conducted to help countries examine how students perform and identify educational areas for improvement. In view of this, they recommended that there may be a need to revisit the implementation of curriculum in other science schools. Periodic evaluation of the effectiveness of the special curriculum being followed in the other



Philippine Normal University

The National Center for Teacher Education

SHS may be done in order to determine the improvement that would have to be done in SHS.

In 2006, Tan conducted a study that assessed the level of effectiveness of Region IV- A Regional Science High School based from the perception of the stakeholders. The researcher employed descriptive- survey method of research together with interview, observation, and documentation analysis. The data were gathered by means of validated survey instrument consisting of two sets of parallel questionnaire. The findings revealed that the Regional Science in Region IV- A based on the selected components were very effective.

Andujare (2009) conducted a study which assessed the Biology program of selected science high schools in Metro Manila. She employed a descriptive method of research particularly of the survey type with developmental and evaluative aspects in assessing the supervisory management, administrative management, and efficiency and effectiveness of the program. After thorough analysis of data, she recommended that periodic evaluation of the effectiveness of the area component of the Biology program be conducted to monitor its implementation through identification of its strengths and weaknesses. Based from the identified weaknesses in the program, she proposed a quality strategic plan for the enhancement of the Biology program.

A descriptive development type of research was used by Garcia (2012) in assessing the educational management in the graduate studies program in a state university and the result was used as basis for program enhancement. Using a



Philippine Normal University

The National Center for Teacher Education

questionnaire, she found out that the VMGO, faculty, curriculum, and instruction, support to students, physical plant and facilities, and administration were very much observed while research, extension linkages, and community involvement, library and laboratories were observed. The strengths and weaknesses in the indicators were compared against the TQA and the results guided her in proposing an enhancement program. She recommended that the enhancement program be implemented by the management through collaborative efforts of all concerned.

Science Education

A primary objective in science education and mathematics education is satisfactory students' achievement, that is, meaningful learning of science and mathematics concepts, skills and scientific values (NISMED, 2003).

In the Philippines, the Department of Education clearly articulates that the science education aims to develop scientific literacy among students that will prepare them to be informed and participative citizens who are able to make judgment and decision regarding applications of scientific knowledge that may have social, health, or environmental impacts.

Similarly, the president of the Philippines, his Excellency Pres. Benigno C. Aquino Jr. also recognizes the importance of science and mathematics education as he included the improvement of science oriented high school in his ten point agenda. In view of this, the science curriculum recognized the place of science and technology in everyday human affair. It integrates science and technology in the



Philippine Normal University

The National Center for Teacher Education

civic, personal, social, economic, and the values and ethical aspects of life. The science curriculum promotes a strong link between science and technology, including indigenous technology, keeping our country's cultural uniqueness and peculiarities intact.

In the reform made in the educational system in the Philippines, the science education has given more direction as the conceptual framework of the science curriculum has been engineered to suits to the needs of the Filipino students. The conceptual framework emphasize that whether or not students pursue careers that involve science and technology, the K to 12 science curriculum will provide students with a repertoire of competencies important in the world of work and in a knowledge-based society.

The K to 12 science curriculum envisions the development of scientifically, technologically, and environmentally literate and productive members of society who manifest skills as critical problem solvers, responsible stewards of nature, innovative and creative citizens, informed decision makers, and effective communicators.

This curriculum is designed around the three domains of learning science: understanding and applying scientific knowledge in local setting as well as global, context whenever possible, performing scientific processes and skills, and developing and demonstrating scientific attitudes and values. The acquisition of these domains is facilitated using the following approaches: multi/interdisciplinary



approach, science–technology society approach, contextual learning, problem/issue-based learning, and inquiry-based approach. The approaches are based on sound educational pedagogy namely: constructivism, social cognition learning model, learning style theory, and Gestalt psychology.

Science content and science processes are intertwined in the K to 12 curriculum. Without the content, learners will have difficulty utilizing science process skills since these processes are best learned in context. Organizing the curriculum around situations and problems that challenge and arouse students' curiosity motivates them to learn and appreciate science as relevant and useful. Rather than relying solely on textbooks, varied hands-on, minds-on, and hearts-on activities will be used to develop students' interest and let them become active learners.

As a whole, the K to 12 science curriculum is learner-centered and inquiry-based, emphasizing the use of evidence in constructing explanations. Concepts and skills in Life Sciences, Physics, Chemistry, and Earth Sciences are presented with increasing levels of complexity from one grade level to another (spiral progression), thus paving the way to deeper understanding of a few concepts. These concepts and skills are integrated rather than discipline-based, stressing the connections across science topics and other disciplines as well as applications of concepts and thinking skills to real life.



Philippine Normal University

The National Center for Teacher Education

The vision that place for the development and improvement of science education in the Philippines is very clear, however, the result of this reform is wait to be seen since the new curriculum is mere new and the impact cannot be seen yet.

The Committee on STEM Education (2013) reported that the 14 Federal CoSTEM agencies in America invest in and support program and activities to improve STEM education. These agencies also maintain and fund important assets such as laboratories, research, instruments, and facilities, and employ engaged and knowledgeable scientists, researchers, and engineers. In addition, Federal support for STEM education enables the

1. Preparation and professional development of STEM teachers and undergraduate faculty in their subject areas, in pedagogy, and in instructional practice through pre-service education and continuing professional development, as well as efforts to enhance teacher recruitment and retention;
2. Development of instructional materials, learning resources, and courses, including materials that can be integrated into curricula (such as videos, assignment and activity ideas, computer visualizations and simulations), and platforms for building and delivering interactive online courses and learning objects;



Philippine Normal University

The National Center for Teacher Education

3. Training and re-training to match U.S. workforce skills to the demands of a rapidly-changing global economy and the STEM workforce to accomplish the missions of Federal agencies;
4. Direct support to students in disciplines related to agency missions through scholarships, fellowships, immersion research experiences in agency operations, training grants, internships, and other programs;
5. Research and development to understand and improve STEM education and learning programs at all levels, including research on: STEM learning and instructional strategies, learning in informal environments, ways to improve the preparation and professional development of teachers and faculty, STEM workforce development educational programs, and broadening participation education efforts;
6. Availability of facilities and staff to institutions engaged in STEM education;
7. Data collection initiatives and program evaluations; and
8. Public education and lifelong learning projects, including publications, websites, videos, simulations, television programs, museum exhibits, and public events.

Meanwhile, The National Science Education Standard (1996) provides program standards for the quality of and conditions for science school programs.



Philippine Normal University

The National Center for Teacher Education

They focus on issues at the school and district levels that relate opportunities for students to learn and opportunities for the teachers to teach science.

1. All elements of the K-12 science program must be consistent with the other National Science Education Standards and with one another and developed within and across grade levels to meet a clearly stated set of goals. In an effective science program, a set of clear goals and expectations for students must be used to guide the design, implementation, and assessment of all elements of the science program. Curriculum frameworks should be used to guide the selection and development of units and courses of study. Teaching practices need to be consistent with the goals and curriculum frameworks. Assessment policies and practices should be aligned with the goals, student expectations, and curriculum frameworks. Support systems and formal and informal expectations of teachers must be aligned with the goals, student expectations and curriculum frameworks. Responsibility needs to be clearly defined for determining, supporting, maintaining, and upgrading all elements of the science program.
2. The program of study in science for all students should be developmentally appropriate, interesting, and relevant to student s' lives; the program of study must be emphasize student understanding through



Philippine Normal University

The National Center for Teacher Education

inquiry. The program of study in science should connect to other school subjects.

3. The science program should be coordinated with the mathematics program to enhance students' use of understanding of mathematics in the study of science and to improve students understanding in mathematics. Coordination of science and mathematics programs provides an opportunity to advance instruction in science beyond the purely descriptive. Students gathering data in science investigation should use tools of data analysis to organize these data and to formulate for further testing.
4. The K- 12 science program must give students access to appropriate and sufficient resources, including quality teachers, time, materials, and equipment, adequate and safe space, and the community. The most important resource is professional teachers. Teachers must be prepared to teach science to students with diverse strengths, needs, experiences, and approaches to learning. Teachers must know the content they will teach, understand the nature of learning, and use a range of teaching strategies for science. Hiring practices must ensure that teachers are prepared to teach science and should include successful teachers of science in the selection of their new colleague.
5. All students in the K -12 science program must have equitable access to opportunities to achieve the National Science Education Standards.



Philippine Normal University

The National Center for Teacher Education

6. Schools must work as communities that encourages, support, and sustain teachers as they implement an effective science program. Schools must explicitly support reform efforts in an atmosphere of openness and trust that encourages collegiality. Regular time needs to be provided and teachers encouraged to discuss, reflect, and conducts action research around science education reform. Teachers must be supported in creating and being members of networks of reform. An effective leadership structure that includes teachers must be in place. Many previous reform efforts have failed because little attention was paid to the connection between teacher enhancement, curriculum development, and the school as a social and intellectual community. Teachers with new ideas, skills, and exemplary materials often worked in an environment where reform was not valued or supported.

The consensus on the importance of science education is also seen in the political agenda of many European countries. All countries have developed specific polies and projects and many of the initiatives in European countries are related to school partnerships, the establishment of science centers and guidance measures these specific projects are frequently joint-efforts, put in place by the government institutions together with partners from higher education of from outside the education sector. Another important area on which many countries focus their effort



Philippine Normal University

The National Center for Teacher Education

is the continuing professional development (CPD) of science teachers (European Commission, 2011).

Areas usually considered important and in need of improvement at the level of school education are curricula, teacher education, and teaching methods. The governments are trying to achieve these aims through measure such as: implementing curriculum reforms; creating partnerships between schools and companies, scientists and research centers, setting up science centers and other organizations; providing particular guidance measures to encourage more young people, particularly girls, to choose scientific careers; cooperating with universities to improve initial teacher education; and initiating projects focusing on continuing professional development.

In the recent years, the interest of Asian and Pacific students in pursuing science- related careers, and general interest in science and technology has diminished. In effect, the low quality science education, limited resources devoted to science and technology developing among some countries, deterioration of scientific and technological literacy in the region, and loss of competitiveness globally in the field of science and technology (UNESCO, 2009)

On Management of the STE Program

The management function is assigned to managers, and leaders respectively. Leaders and managers with their management, guidance, planning ought to create



Philippine Normal University

The National Center for Teacher Education

positive working climate, so that participants in school system would take pains as well as invest greater endeavor (Tasic, Tubic, Sc, and Mitic, 2011).

The central focus of school effectiveness research concerns the idea that “schools matter, the schools do have major effect upon children’s development and that, to put it simply, schools do make a difference. The effectiveness of school has been seen on the skill of the school leaders and managers in managing and leading the schools with the support of the school personnel.

Tamkin et. al. (2003) suggest that managers need the ability to: empower and develop people – understand and practise the process of delivering through the capability of others; manage people and performance – maintain morale while also maximizing performance; work across boundaries, engaging with others, working as a member of a team, thinking differently about problems and their solutions; develop relationships and a focus on the customer, building partnerships with both internal and external customers; balance technical and generic skills – the technical aspects of management and the management of human relationships.

Fayol in Greener (2010) outlined five key points in a traditional framework of management which becomes a model for most of the managerial administration that followed in the 20th century. The key points include planning, organizing, coordinating, commanding, and controlling.



Philippine Normal University

The National Center for Teacher Education

Planning is a key aspect of managing for results. Planning involves deciding on a course of action, ensuring that the resources required to implement the action will be available and scheduling and prioritizing the work required to achieve a defined end result (Armstrong, 2009).

The aim of planning is to enable managers to complete tasks on time by making the best use of the resources available to them. They need to avoid crises and the high costs that they cause; to have fewer 'drop everything and rush this' problems. Contingency or fall-back plans are prepared if there is any reason to believe that the initial plan may fail for reasons beyond the manager's control.

The development of SIP manual helped accelerate the SBM implementation. Series of capability- building programs on SIP formulation were conducted to equip school heads with knowledge and skills in preparation of data driven SIPs.

Effective school improvement plans include comprehensive analysis of school problems, thoughtful identification and selection of solutions, and meaningful implementation of research proven solution (American Federation of Teachers, 2006).

Berns (2004) revealed that the most effective school improvement plans are collaboratively developed by individuals who represent all stakeholders in the school community, who are actively involved in leading and monitoring improvement efforts, and who have a strong commitment to the process.



Philippine Normal University

The National Center for Teacher Education

In line with the importance of planning, Bateman and Snell (2007) suggest that the difference between a successful and unsuccessful manager depends on their planning procedure. Planning involves the logical thinking through the organization's goals and establishing an overall strategy to achieve those goals. Through planning managers are able to develop a comprehensive set of plans for the future. Those plans would guide them in integrating and coordinating the organization's work. Therefore, planning for an organization is like a blueprint to foresee the possible problems, which helps the management to decide on the effective and efficient decisions to avoid issues while guiding the organization to achieve desired goals.

Robbins and Coulter (2005) emphasized the difference between formal and informal planning; their results show the main difference is that informal planning specific goals are set for a specific period of time. These goals are written formally and have been set from shared ideas of organizational members. Accordingly, a specific action program would be considered in order to achieve the goals. Defining the path to go through all the steps of planning is critical management task. Moreover, setting goals, establishing strategies to achieve strategies to achieve them and developing a set of plans to integrate and coordinate activities are the essential tasks needing careful and accurate planning. Correspondingly, the benefits of planning for organizations include; providing direction to move forward; reducing



Philippine Normal University

The National Center for Teacher Education

uncertainty in decision-making; preventing waste of time and money; and setting the standards used in controlling.

To achieve their goals, managers have to ensure that they have the resources required and that the human element of those resources is properly organized in the sense of deciding what needs to be done, grouping activities together, establishing lines of communication and control and defining responsibilities and accountabilities. Managers or team leaders may have been promoted, transferred or recruited into a post and presented with an established organization structure. Very occasionally, they may have to set up their own organization. More frequently, they may feel that there are improvements that can usefully be made to the structure or to the ways in which responsibilities and tasks are allocated to members of their team.

The aim of organizing can be defined as being to optimize the arrangements for conducting the affairs of the business or business unit. To do this it is necessary, as far as circumstances allow, to: clarify the overall purposes of the organization or organizational unit; define the key activities required to achieve that purpose; group these activities logically together to avoid unnecessary overlap or duplication; provide for the integration of activities and the achievement of cooperative effort and teamwork in pursuit of the common purpose; build flexibility into the system so that organizational arrangements can adapt quickly to new situations and challenges; clarify individual roles, accountabilities and authorities; design jobs to make the best



Philippine Normal University

The National Center for Teacher Education

use of the skills and capacities of the job holders and to provide them with high levels of intrinsic motivation.

Leading is the use of influence to motivate employees to achieve the organizational goals. It means creating a shared culture and values, communicating goals to the employees throughout the organization and infusing employees with the desire to perform at a high level (Daft, 2000). Through leading, managers build commitments, encourage activities that support goals, and influence others to do their best work.

Chua (2013) in her dissertation found out that the leading was greatly manifested in the management practices among administrators in state universities in CALABARZON region. She relates that this management practice of the administrators was associated to their behaviours such as communicating through dialogue, setting conflicts through negotiation, maintaining working relationships, and similar activities. Moreover, the faculty considered the administrators as key persons that lead the organization in accomplishing tasks.

Falogme (2011) assessed the management functions of the public secondary school principal and students' services in a division. He assessed the management functions in terms of planning, budgeting, organizing, staffing, leading, motivating, evaluating, and rewarding while the student services were in terms of medical-dental services, school canteen services, school safety and security services, library



Philippine Normal University

The National Center for Teacher Education

services, guidance and counselling services, sports program and spiritual outreach program.

Using descriptive developmental method of research he found out school principals were very satisfactory in planning. Teachers and stakeholders were involved in developing and designing plan or program of action however, the school principals are weak in utilizing data from assessment and evaluation in identifying targets and priorities and in setting up strategic and priorities. He opined that all the variables in management functions were found related with one other.

Ghavifekr et. al made a conclusion that the four management functions are the key elements in organizational success. In order to attain the desirable goals and objectives, these functions must be developed in effective, an efficient way to best suit the organization's activities.

Quality Management of STE Program

Armstrong (2009) made a succinct definition that quality management is concerned with all the activities required to ensure that products and services conform to the standards set by the organization and meet expectations of customers. These activities include the steps taken to ensure that high quality is achieved (quality assurance), and the actions taken to check that defined quality standards are being achieved and maintained (quality control).



Philippine Normal University

The National Center for Teacher Education

The approach to quality management generally used today owes much to the contributions of the quality gurus, especially Deming, Juan and Crosby, who spelt out the conditions and behaviour that promote quality as summarized below:

Deming (1986) emphasized the importance of customers, the significance of continuous improvement and the fact that quality is determined by the system. He believed that customer satisfaction is created by a combination of responsiveness to customers' views and needs and continuous improvement of products, services and operational systems.

Deming suggested that managers are in control of the organization and are responsible for its performance. The quality process is in two parts: the system, over which managers have control and which contributes 80 per cent of the variation in quality, and the workers, who are under their own control and who contribute 20 per cent of the variation in quality. Major variations in quality therefore come from managers improving the system rather than workers improving their performance.

Juran's main contribution to the philosophy of total quality was his concept of managerial breakthrough (Juran, 1988). In the traditional control situation, the typical managerial attitude is that the present level of performance is good enough or cannot be improved. The aim is therefore to perpetuate performance at that level. Management attempts simply to identify and eliminate short-term deviations from the usual performance.



Philippine Normal University

The National Center for Teacher Education

Juran stated that in the breakthrough situation management adapts a completely different attitude. The belief is held strongly that change is desirable and possible in all aspects of operation. It is up to managers to make the 'breakthrough'. They must recognize and act on the need for what is, in effect, continuous improvement.

Crosby (1978) emphasized that 'in discussing quality we are dealing with a people situation'. He suggested five factors that govern the management of quality: Quality means conformance, not elegance; there is no such thing as a quality problem; there is no such thing as the economics of quality. It is always cheaper to do the job right first time; the only performance measurement is the cost of quality; the only performance standard is zero defects.

Recto (2009) focused his study in assessing the responsibilities of the public elementary school principals using SBM model. The findings of the study revealed that the management and leadership of the school heads in managing the schools are demonstrated. However, weaknesses in ten domains were observed. The identified weaknesses led him in developing guidelines which would enhance the management and leadership capability of the principals. He recommended that the school heads should provide trainings, workshops, and symposium for the staff.

Somido (2004) analysed the administrative and supervisory management skills of institutions and middle-level school managers in the University of Perpetual Help System and the results of the investigation was used as basis in the development of workplace approaches. Among the findings of is study were; the



Philippine Normal University

The National Center for Teacher Education

administration management skills of institutional heads and middle level school managers were planning and supervising as well as accomplishing skills; leading, organizing, and rewarding.

On Leadership

School leadership is commonly considered to have a significant influence on school effectiveness and improvement. Effective school leaders are expected to successfully introduce and support change and innovation at the school unit (Menon, 2013).

Bush (2007) believes that the early part of the 21st century brought great interest in educational leadership due to the widespread belief that the quality of leadership makes a significant difference to school and student outcomes. He stresses that:

“there is an increasing recognition that schools require effective leaders and managers if they are to provide the best possible education for the learners. The schools need trained and committed teachers but, they in turn, need a leader of highly effective principals and support from other senior and middle managers.”

Welch in Slater (2003) reveals that one of the secret in leadership is to nurture employees who share the company's values. He advised to give employees more responsibility so that they will make better decisions. By making the employees more accountable, the organization will be more productive. To achieve this, he added that leaders and managers must remove the barriers that hinder the attainment of goals of an organization. Anything that disrupts communication



Philippine Normal University

The National Center for Teacher Education

between departments and employees or between employees and outside constituents is bad. To achieve *boudaryness* in an organization, involved everybody.

The importance of leadership has been identified as crucial to the change process and to improving student learning in studies related to leadership, effective schools, school improvement, and school change and implementation (Sheppard, 2009). It is supported by Fullan (2001) in saying that the importance of leadership in generating and sustaining school development and change has been highlighted and reinforced in the contemporary literature.

The educational leadership field is experiencing a paradigm shift in terms of its current theorizing. The traditional view of leadership as that associated with individual role or responsibility is gradually being replaced by alternative leadership theories that extol the virtues of multiple sources of leadership. Contemporary theorizing about leadership has moved away from the traditional 'transactional versus transformational' divide into a more sophisticated amalgam of theoretical lenses. One of these powerful lenses is distributed leadership which reinforces that leadership is not the preserve of one individual. Implicit within the current discourse about distributed leadership theory is the idea that leadership is something many people are able to exercise and that leadership 'is not the realm of certain people in certain parts of the organization' (Ogawa and Bossert 1995).

Sanchez (1996) verifies that in order to become an effective leader, one must act as resource person who can model and help the group in processing and



Philippine Normal University

The National Center for Teacher Education

broadening their perspective so that they will be able to regard the problem in different views. He added that a person with good leadership trait sincerely believes in the creativeness of human intelligence and focus in cultivating leadership in others by providing them an avenue which will showcase their full potentials. Most importantly, a good leader stimulates the individual members to think reflectively and then guides them in weighing ideas and appraising based on the objective criteria.

Peters and Austin (in Sallis, 2002) gave specific consideration to educational leadership and claimed that educational leader as needing the following attributes:

Vision and symbols—the head teacher or principal must communicate the institution's values to the staff, pupils and students and the wider community.

Management by walking about is the required leadership style for any institution.

For *the kids*'—this is their educational equivalent to 'close to the customer'. It ensures that the institution has a clear focus on its primary customers.

Autonomy, experimentation, and support for failure—educational leaders must encourage innovation among their staff and be prepared for the failures that inevitably accompany innovation.

Create a sense of 'family'—the leader needs to create a feeling of community among the institution's pupils, students, parents, teachers and support staff.

Sense of the whole, rhythm, passion, intensity, and enthusiasm— these are the essential personal qualities required of the educational leader.

Leaders have a pivotal role in guiding teachers and administrators to work for and in concert with their client groups. Spanbauer's model is one of leadership for empowerment. His conclusions are:



Philippine Normal University

The National Center for Teacher Education

- Involve teachers and all staff in problem-solving activities, using basic scientific methods and the principles of statistical quality and process control.
- Ask them how they think about things and how projects can be handled rather than telling them how they will happen.
- Share as much management information as possible to help foster their commitment.
- Ask staff which systems and procedures are preventing them from delivering quality to their customers—students, parents, co-workers.
- Understand that the desire for meaningful improvement of teachers is not compatible with a top-down approach to management.
- Rejuvenate professional growth by moving responsibility and control for professional development directly to the teachers and technical workers.
- Implement systematic and continued communication among everyone involved in the school.
- Develop skills in conflict resolution, problem solving and negotiations while displaying greater tolerance for and appreciation of conflict.

Leithwood (2003) challenged that district and school leaders have to motivate their teams and help them acquire the skills and knowledge they need. This might involve conducting staff meetings focused on improving a specific part of teaching, such as using informal assessments in the classroom. Principals who control their school's budgets exercise instructional leadership by devoting resources to such purposes.

Strong leaders mentor staff members, work to bolster their confidence, and enthusiastically embrace change. "It has to do with leaders' sensitivity to ... the needs of the people they're working with," Leaders also have to work on "continually redesigning the organization so it actually helps people do these things



Philippine Normal University

The National Center for Teacher Education

rather than stands in their way,” This means building a culture focused on results, protecting the school from outside interference and “having decent managerial practices in place so the organization is relatively stable and you can build on that stability.”

Finally, effective school and district leaders have to be willing to compete rather than complain about being held accountable for raising student achievement, embrace the challenge involved.

Bennis (2003) emphasizes the fact that modern leaders must not rely on their personal skills or charisma to produce change. He identifies four critical characteristics of effective leadership. First, leaders must be able to engage others through the creation of a shared vision. Second, leaders must have a clear voice that is distinctive to constituents. This voice should be characterized by a sense of purpose, a sense of self, and self-confidence. Third, leaders must operate from a strong moral code and a belief in a higher good that fuels their efforts. Finally, leaders must have the ability to adapt to relentless pressure to change.

Block (2003) frames leadership as the act of effective questioning. Specifically, he suggests that asking “how” questions too early in the change process undermine the power of dialogue. Block suggests that effective leaders are social architects who create a “social space” that enhances or inhibits the effectiveness of an organization. The ideal social space is one conducive to solving even the most perplexing of organizational problems. For Block, critical leadership skills include



Philippine Normal University

The National Center for Teacher Education

convening critical discussions, naming the question, focusing discussion on learning as opposed to premature closure on solutions, and using strategies for participative design of solutions.

Collins's (2001) explains that Level 5 leaders possessed the following characteristics: (1) relying on high standards as the primary vehicle for attaining goals, as opposed to personal charisma, (2) surrounding themselves with the right people to do the job, (3) creating a culture of discipline (4) honestly looking at the facts regarding their companies (5) entertaining difficult questions regarding the future of their companies

The work of Covey, like that of Collins, has been highly influential in education even though it is not directed toward educators per se. Covey (1989) posits seven behaviors that generate positive results in a variety of situations. He frames these habits as directives.

1. *Be proactive* refers to controlling your environment as opposed to letting it control you. The effective leader must control his environment by responding to key situations and circumstances.
2. *Begin with the end in mind* means that an effective leader always keeps the goals of the organization in mind.
3. *Put first things first* refers to focusing on those behaviors that are directly related to the goals of the organization. Actions to this end have priority over all other actions.
4. *Think win-win* involves ensuring that all members of an organization benefit when the goals of the organization are realized.



Philippine Normal University

The National Center for Teacher Education

5. *Seek first to understand and then to be understood* involves establishing strong lines of communication by listening to and understanding the needs of those within the organization.
6. *Synergize* refers to the principle that cooperation and collaboration will produce more than can be expected from the isolated efforts of individuals.
7. *Sharpen the saw* involves learning from previous mistakes and developing skills to ensure that they are not repeated.

For Covey, effective leaders communicate by their actions a clear sense of purpose and what their lives stand for. The selection of a next step is guided as much by a person's purpose in life as it is by the demands of the task at hand. Thus for Covey, the highest and best use of a person's time is that action that most effectively addresses the problems at hand and is most consistent with the individual's identified purposes in life.

Elmore (2000) provides a unique perspective on the role of leadership. He agrees that those who promote instructional leadership emphasizes the importance of understanding effective practices in curriculum, instruction, and assessment and the ability to work with teachers on the day-to-day problems related to these topics. He warns, however, that the knowledge base one must have to provide guidance on curriculum, instruction, and assessment is vast.

One of the critical factors in developing effective schools is the leadership and vision of the principal (Hayes, 2008). Principals play a vital role in creating



Philippine Normal University

The National Center for Teacher Education

successful schools, but existing knowledge on the best ways to prepare and develop highly qualified candidates is sparse (Hammond, Meyerson, LaPointe, and Orr, 2010).

Some studies suggest that a principal's particular leadership style is less important than his or her ability to act as an effective instructional leader and to establish a relationship of trust with his or her staff. Many researchers cited in Flath, (1989) stress the importance of the instructional leadership responsibilities of the principal; however, the consensus in the literature regarding this issue is that it is seldom practiced. As instructional leader, the principal is the pivotal point within the school who affects the quality of individual teacher instruction, the height of student achievement, and the degree of efficiency in school functioning.

In today's world, Hanny (1987) perceives that "effective principals are expected to be effective instructional leaders. The principal must be knowledgeable about curriculum development, teacher and instructional effectiveness, clinical supervision, staff development and teacher evaluation". Bryce (1983) and Fullan (1991) agree with this holistic view of the principal's role. However, Fullan expands this holistic definition of leadership and management to be: an active, collaborative form of leadership where the principal works "with teachers to shape the school as a workplace in relation to shared goals, teachers collaboration, teacher learning opportunities, teacher certainty, teacher commitment, and student learning".



Philippine Normal University

The National Center for Teacher Education

This collaborative nature of leadership is often stressed in the literature. Bernd (1992) states that "increased teacher involvement in school decisions are effective tools for focusing the staff on student's outcomes". Hallinger (1989) speaks of leadership teams at the secondary level to help carry out the critical functions of curriculum and instructional coordination and supervision. Cooper (1989) states that schools need to create models of shared leadership which incorporate the talents and energy of principals, teachers, students, and parents. This mode of instructional leadership provides for learning and working with others - teachers, students and parents - to improve instructional quality. It is their responsibility to create a strong school culture, enabling teachers to collaborate with them in redesigning the instructional program so that all students can learn.

In a recent study 'How Context Matters in High Need Schools' Johnson, Kraft and Papay (2012) found that the conditions most important for teacher satisfaction are "the ones that shape the social context of teaching and learning." While typical working conditions such as safe facilities, adequate resources and lesson preparation time, are important, the three most important elements for teacher satisfaction are: (a) collegial relationships or the extent to which teachers have productive working relationships with their colleagues (b) the principal's leadership or the extent to which teachers report that their school leaders are supportive and create school environments conducive to learning, and (c) school culture or the



Philippine Normal University

The National Center for Teacher Education

extent to which school environments are characterized by mutual trust , respect , openness, and commitment to student achievement.

Tirozzi mentioned that the principal- the instructional “artist in residence” – establishes a climate for excellence, puts forward a vision for continuous improvement in student performance, promote excellence in teaching, and commits to sustained, comprehensive professional development for all staff members.

The National Association of State Boards of Education posits that good principals lead change, inspire students and staff, leverage resources to make improvement happen, and bring community members into the process of change.

The institute for Educational Leadership supported that principals today must also serve as leaders for student learning. They must know academic content and pedagogical technique. They must work with teachers to strengthen skills. They must collect, analyze and use data in ways that fuel excellence. They must rally students, teachers, parents, local health and family service agencies, youth development groups, local business and other community residents and partners around the common goal of raising student performance. They must have the leadership skills and knowledge to exercise the autonomy and authority to pursue these strategies.

Leithwood and Duke identified six distinct conceptions of leadership after they had examined all articles in educational leadership published in journals. According to them, (a) leadership is instructional that is influencing the work of teachers in a way that will improve student achievement, (b) transformational by increasing the commitment and capacities of school staff, (c) moral by influencing



Philippine Normal University

The National Center for Teacher Education

others by appealing to notion of right or wrong; (d) participative when involved other members of the school community, (e) managerial by operating the school efficiently, and (f) contingent when the leaders adapting their behavior to fit the situation.

Foster (2004) investigated the impact of leadership on school improvement. She explores how the concepts and practices of leadership are understood in relation to school improvement. She finds a relationship between leadership and school improvement in her study. Foster found that the schools set an example of effective inter-relationships among educators, pupils and parents. The schools run advocacy meetings and leadership team meetings; they also hold education planning committees and cohort group meetings where all the students and teachers work towards a common purpose of school improvement. Teacher collaboration and on-going professional learning are essential to sustain the improvements. Teacher leadership is as important as principal leadership. Students and parents play a vital role in goal-setting and decision-making for the schools even though they are excluded from formal leadership.

Foster suggests that school improvement may be served better by the overall leadership of principal, teachers, students and community. Leadership for school improvement could be defined as a shared social influence process.

In 2011, Salahuddin conducted a study about the perceptions of effective leadership in Bangladesh Secondary School. His findings provide data on principals' perceptions of school leadership in Bangladeshi secondary schools, and teachers'



Philippine Normal University

The National Center for Teacher Education

perceptions of the elements of distributed leadership in secondary schools in Bangladesh.

The principals indicated that effective leadership, which guides and directs teachers to school success, is important for a school. Such leadership was characterized by good interaction among principals, students, teachers, parents and community members. All the principals reported that discussion is an important element of effective decision-making. While they reported using different styles to solve issues, they always tried to consider the opinions of others, without bias, rather than depending on their own judgment. The principals also reported revisiting and revising their decisions to ensure the best outcome for complex problems. They aim to get the jobs completed on time with the help of their teachers and some try to encourage teachers by providing rewards and punishments.

The principals use different leadership approaches to make their schools successful. They have to distribute their tasks to lead the school in an expert way and in delegating tasks they consider a number of factors such as personal skills and competency, and time of delegation. The comments from the principals strongly suggest that they consider leadership to be closely linked to the allocation of tasks and responsibilities, and senior teachers get priority when tasks are delegated. Although principals reported facing a number of problems when delegating tasks, they believe that they have to coordinate the allocated tasks to make a collective and collaborative environment for improved teaching and learning.



Philippine Normal University

The National Center for Teacher Education

Effective school leaders are able to utilize the skills of all in the schools to reach school goals within a minimal time. Riley and MacBeath (2003) describe effective leaders as follows: “Good school leaders are those who are able to maximise the diverse leadership qualities of others, enabling them to take on leadership within their areas of expertise. They lead by managing, motivating and inspiring people”. School principals are being effective when they are visionary and clear about their mission. Such principals can achieve school success by motivating teachers and creating a collaborative community in schools. If schools lack effective leadership, seldom they can reach their own articulated goals.

Harris’ (2002) study examines the essentials of effective leadership in schools facing challenging contexts in terms of achievement rates in public examination and socio-economic status. This study explains that to be successful a range of leadership styles is needed; no one style is perfect for all situations. She argues that most of the research in schools that are challenging in terms of their social contexts, deals with the difficulties rather than leadership practices.

Harris found that the success of a leader in challenging contexts varies depending on the particular situation and context of the school. Factors affecting success include the school’s vision and values, distributing leadership, investing in staff development, developing and maintaining relationships, and community building. All the principals worked to empower students, staff and parents to play a part in leadership. They imply that successful leaders are people-centred and give importance to human needs rather than to organisational needs according to personal



Philippine Normal University

The National Center for Teacher Education

and professional values. They also distribute their leadership to other teachers. The study suggests that school leadership is a collective endeavour which succeeds by involving all teachers in leadership and tapping their skills.

Robinson et. Al (2009) provides a rich framework for principal leadership and transition of school leadership from the heroic to pedagogical approach to suit various New Zealand contexts. In the report, the authors define leadership as, “leadership that causes others to do things that can be expected to improve educational outcomes for students” which indicates pedagogical leadership in schools.

Pedagogical leadership entails in-depth knowledge and support of teaching and learning. Pedagogical leaders work with others to develop and improve student learning in schools (Robinson et al., 2009). These leaders are very much involved in the process of instructional improvement. The progress of schools is measured by improvement of achievement of students through effective classroom teaching strategies.

Decisions in schools regarding goals, curriculum, budgeting and property are made taking into consideration how they could positively impact on teaching and learning. Pedagogical leaders can effectively create the environment for improvement of teaching and learning and build capacity of teachers to focus on classroom teaching and learning, in collaborative ways, which in turn enhance school success (Bush, 2008; Southworth, 2004).



Philippine Normal University

The National Center for Teacher Education

Effective leadership is developed through collaborative professional learning and aims at purposeful change in schools. All teachers have potential to contribute to leadership for school improvement, but need scope for engaging themselves. The positional leader is designated to develop organisational procedures; build the cultural climate; and provide support for all teachers to be able to contribute their knowledge and skills to leadership which helps to build leadership capacity (Hopkins & Jackson, 2003). This concept of leadership puts school leaders in a position where their leadership roles become more fluid and distributed than any other forms of leadership.

School leadership requires capability to develop, communicate, and put into place a vision for school improvement that marshals the energies of disparate members of a staff around common goals. Visionary leadership enables staff members to regard the most mundane aspects of their roles in light of their relation to promoting student learning (Danielson, 2002). Leadership can be excised by anyone in the school; true leaders can include teachers, or even school secretary.

According to Corconan, Fuhrman, and Belcher (2001) developing school capacity requires strong leadership. All members of the school staff are responsible for helping students learn because they share a belief that all students possess capacity to learn (Edmonds, 1984).

In improving the cooperation and collaboration in schools, principal should provide continuous visible support and reorganize school resources as time, staff, and money to enable learning by all (Wilson and Corbett, 1999).



Philippine Normal University

The National Center for Teacher Education

Encouraging teachers to collect organize and evaluate school and classroom data to inform their practice can improve a school (Senese, 2000). According to Fullan (2000), teachers demonstrate leadership by developing practices that move away from desirable norms, such as teaching in isolation and teaching as technical work.

Chen (2007) focused in her study on the principal's distributed leadership behaviour and their impact on student achievement in selected elementary schools in Texas. The findings in his study indicated that principals' collaborative working style with teacher leaders seems to have positive impact on student achievement. Failing to enlist teacher leaders in a common vision might have a negative effect on student academic performance. Teacher leaders reflected a need for the principal to take challenges and seek challenging opportunities to change and grow. They recognizing teacher leaders' contributions and celebrating team accomplishments is likely to have a positive and indirect impact on school academic performance. The positive impact of "Enabling Others to Act" and "Inspiring a Shared Vision" on student achievement implies that distributed leadership is most likely to contribute to school improvement and to build school capacity for improvement.

Balajadia (2012) utilized the explanatory method, a kind of mixed method of research in creating a leadership framework for Teacher Education Institutions based on surveyed, documented, analysed, and synthesized perspectives of regular and outstanding basic education teachers during their pre- service teacher education.



Philippine Normal University

The National Center for Teacher Education

His findings revealed that being committed, dedicated, role model of effective teaching, exemplar of positive values, and transformational managers are the qualities of the deans and school leaders that influence the competencies of the outstanding teachers. Likewise, he added that implementing various student development programs, manifesting faith in God, openness and transparency, and instituting management boosters were the most essential management and leadership qualities and practices that outstanding basic education teachers recommend to develop future outstanding teachers from the pre-service teachers.

Joven (2006) assessed the leadership styles of department heads of state university system. His findings showed that the college/ deans and academic department heads preferred participative style of leadership while the faculty members prefer the supervisory leadership styles. Moreover, factors which influence the leadership style and academic leadership functions were related to (a) participative leadership and organizing the staff, (b) supportive leadership style and learning and motivating, and (c) directing leadership style and assessing and rewarding.

Curriculum Management

The curriculum is the heart of the educational system. In 1999, the policy direction was for decongesting the curriculum. That led to the formulation of the Basic Education Curriculum for the elementary level and the Restructured Basic Education Curriculum for the secondary level. The implementation of the curriculum



Philippine Normal University

The National Center for Teacher Education

included training of teachers and administrators, development of modules and training materials, and close monitoring and assessment of program implementation. A vital part of the restructured curriculum is the promotion of the use of Information and Communication Technology (ICT) in every learning area. DepEd, through its Computerization Program, provided computers and peripherals to recipient public high schools nationwide. Other government agencies like the Department of Trade and Industry (DTI), local governments, and private firms such as Intel likewise contributed to the advancement of computer education in public elementary and high schools through donations of computers (Philippine Education for All 2015).

Curriculum leaders should review and monitor curriculum policies to make sure the policies align with curricular goals and support student learning

Ogena et. al recommendation in revisiting the implementation of curriculum in science schools that performed far behind the PSHS. Periodic evaluation of the effectiveness of the special science curriculum being followed in the other science high schools may be done in order to determine the improvement that would have to be done. They further recommend that the science high schools may look into the curriculum and practices of PSHS and the schools teaching advanced mathematics in other countries or them to improve their performance.

The Curriculum Framework of Science and Technology/ Engineering in the Department of Education (2001) in Massachusetts presented the guiding principles which articulate ideals of teaching, learning, assessing, and administering science



Philippine Normal University

The National Center for Teacher Education

and technology/ Engineering program. An effective science and technology/ engineering program builds student's understanding of the fundamental concepts of each domain of science and their understanding of the connections across these domains and to basic concepts in technology/. Engineering, Science and technology/ engineering are integrally related to mathematics, an effective program in science and technology/engineering addresses students' prior knowledge and misconception, students learn best in an environment that conveys high academic expectations for all students.

Santiago (2012) proposed a competency enhancement plan on curriculum development for teachers in a city school division. Using a descriptive- development research design he found out that teachers are most competent in planning domain while the teachers were least competent in implementing domain. Nevertheless, enhancement of the curriculum competence was suggested in order to attain total quality assurance. He recommends that to sustain the curriculum development competence of teachers, they should undergo continuing professional engagements in curriculum development by means of attending seminar/ training/ conference related to individual subject matter. Joining and participating actively in professional organizations designed to sustain quality assurance in curriculum development and benchmarking and building linkages within school division and outside the division jurisdiction to share ideas and gain inputs for their school's division's improvement.



Philippine Normal University

The National Center for Teacher Education

On Student Achievement

The fundamental goal of school improvement is to improved student learning, especially raising the bar and closing the gap so that all students can learn at high levels. Quality teaching is the key determinant of student learning. In the last several years, research on learning has significantly altered traditional understanding of how people learn, and this research is changing the definition of high-quality teaching.

Darling-Hammond and Bransford (2005) provided a comprehensive knowledge base for what teachers will need to know and do, individually and collectively, in the 21st century, including: knowledge of theories of learning; developmentally appropriate teaching to fit the individual needs of students; knowledge of curriculum and subject matter; assessment; classroom management; and, equally important, how teachers develop and learn both in pre-service and once they enter the profession.

Brophy (2010) stated that APA appointed a task force of experts in psychology and education whose charge was to develop a framework of principles based on the field's understanding of what promotes optimal learning. There were 14 principles represent a synthesis of what is known about learners and optimal learning from a psychological perspective and were conceived as a framework for guiding educational practice. Since the principles are deeply rooted in psychological research, they provide educators with a valid mechanism for understanding students



Philippine Normal University

The National Center for Teacher Education

and the processes that undergird educational change. As a result, the principles have been promoted for contributing to meaningful and enduring school reform. Because of their precise attention to the nature of learning from both an individual and collective perspective,

Alexander (in Brophy, 2010), believes that a thorough knowledge of the principles can be an effective catalyst for systemic change. He stresses that “we have chosen to focus on five extremely important themes contained in these principles rather than to discuss each of the 14 individual items specified in the APA document”. Specifically, pared down to their fundamental roots, we hold that the learner-centered principles relate to five essential dimensions of meaningful learning (Murphy & Alexander, 2006). These five dimensions, extensively investigated in psychology and related disciplines, fall under the following headings: (1) the knowledge base, (2) motivation and affect, (3) strategic processing or executive control, (4) development and individual differences, and (5) situation or context. For each of these areas, we consider key findings from the educational research (“What We Know”), along with implications for teachers and teaching (“What It Means”).

Effective schools share a set of characteristics that add up to an environment that fosters student achievement. By setting goals to improve a school’s environment, principals, teachers, school councils, parents, and other community members can make their schools more effective places in which to learn. Highly effective schools share the following characteristics: (1) a clear and focused vision;



Philippine Normal University

The National Center for Teacher Education

(2) a safe and orderly environment; (3) a climate of high expectations for student success ;(4) focus on high levels of student achievement that emphasizes activities related to learning (5) a principal who provides instructional leadership (6) frequent monitoring of student progress; and (7) strong home-school relations.

Fullan (2012) shared that one of the reasons the principal has to develop the whole school is the big finding that schools do well when teachers work in a purposeful way – focusing on instructional improvement and student achievement and well-being. If teachers are to work together successfully, the leader has to help ensure that they are moving in the right direction.

Milton (2009) identifies three dimensions of student's engagement:

1. Social Engagement. A sense of belonging and participation in school life.
2. Academic or institutional engagement: participation in a formal requirement of schooling.
3. Intellectual Engagement: A serious emotional and cognitive investment in learning, using higher order thinking skills (such as analysis and evaluation) to increase understanding, solve complex problems, or construct new knowledge.

According to Stringfield and Teddlie (1988) identified several factors associated with achievement. These include (1) student perception of positive academic climate, (2) principal's sense of school efficacy, (3) family commitment to education, (4) student sense of long- term educational achievement, and (5) absence of negative school climate.

Likewise, Marzano (2003) synthesized another factors affecting student achievement. These factors include; a guaranteed and viable curriculum, challenging



Philippine Normal University

The National Center for Teacher Education

goals and effective feedback, parental and community involvement, a safe and orderly environment; and collegiality and professionalism.

Nessel concurs that thinking skills are the most basic of all skills that can be developed in the classroom and are the foundations of high achievement for all learners. Students learn effectively when they have many opportunities to think at different levels, for different purposes, and in different contexts as an integral part of their learning. He affirms that teachers can help all students be successful by using instructional strategies that lead them to think at high levels for different purposes in different contexts.

Research on teaching revealed that the practices of effective teachers include careful lesson planning, articulation of learning goals of students, monitoring of students work, and use of time-on- task tactics (Brophy and Good, 1986).

Fasko and Grubb (1995) found that effective teachers implement more learner- centered and active- learning practices- such as critical thinking, inquiry- based practices and hands- on activities.

Marzano, Pickering, and Pollock (2001) have identified nine categories of research- based instructional strategies that improved student achievement: identifying similarities and differences, summarizing and note taking, reinforcing effort providing recognition, assigning homework, using nonlinguistic representations, fostering cooperative learning, setting objectives and providing feedback, generating and testing hypotheses and questions, and providing cues and advance organize.



Philippine Normal University

The National Center for Teacher Education

Students obtained higher achievement scores and demonstrated significantly more positive attitudes toward a subject when evaluated using criterion-referenced methods (Wilburn and Felps, 1983). Effective teachers use assessment results not only to evaluate student work, but also to inform teaching methods and as instructional tools in and of themselves (McDonald and Mistretta, 1997).

Teacher knowledge and skill level significantly affect student achievement because teachers regularly use their knowledge base when designing and assessing learning activities; student learning is limited by what the teachers know (Goldhaber and Brewer, 1996).

On Professional Development

Professional development is one of the main tasks of the school officials in ensuring the quality of teaching.

Peterson in Willen (2007) concludes that good leaders make sure their teachers have the resources and training they need to meet expectations while continuously improving and learning. But it's more than that. Good principals create a "set of norms, values and beliefs, rituals and ceremonies, symbols and stories that make up the persona of the school."

Frazin relates that good principals support teachers in ways simple and profound – both making sure they have the basics and are protected from whatever might distract them or undermine their teaching. Delaney, told that an "Effective



Philippine Normal University

The National Center for Teacher Education

principals ... allow you to move freely to do what you need to do,” “while filtering out the bad.”

Professional development opportunities for teachers must account for differing degrees and forms of expertise represented in any group, and they must recognize the nature of quality experiences. Programs must be designed not just to impart technical skills, but to deepen and enrich understanding and ability. Professional development activities must extend over long periods and include a range of strategies to provide opportunities for teachers to refine their knowledge, understanding, and abilities continually.

The success of professional development for practicing teachers is heavily dependent on the organizational dynamics of schooling, such as a climate that permits change and risk-taking, good relationships among school personnel, communication structures, and an appropriate distribution of authority.

Professional development programs therefore must involve administrators and other school staff. All must be committed to ensuring that prospective teachers, new teachers, and practicing teachers who wish to implement new ideas as part of their professional development are supported and integrated into the ongoing life of the school. Finally, those who plan and conduct professional development programs must continually evaluate the attainments of teachers and the opportunities provided them to ensure that their programs are maximally useful for teachers.



Philippine Normal University

The National Center for Teacher Education

As school leaders, it is important to understand the action research process as an effective tool for improving teaching and learning. In doing so, instructional leadership incorporates collegial discussions and action planning, with measurable results of instruction and learning among teachers and students (Calhoun, 1994; Sagor, 2004). In this age of state-mandated curriculum standards and high stakes testing dictating the curriculum in our schools (Grundy, 1987), an instructional leader's role includes strengthening teachers' self-confidence and self-efficacy through action research.

Shultz and Kim (200) revealed that effective teachers and administrators are reflective practitioners who focus on students' achievement and school improvement. A strategy to achieve these goals is the availability of effective professional development. The collaborative learning practice provided the opportunity to not only give and receive knowledge but also view as an avenue in exchanging responsibilities to create a collaborative culture within a university.

Sparks and Hirsh (1997) discussed a paradigm shift in professional development envisioning a change from an "expert" guest speaker expounding their knowledge to the teachers to a more collaborative and active approach.

Research on professional developments according to Richardson (2003), relates the necessity to have topics which focus on meeting specific needs, training their employees to promote school wide effectiveness, fostering a shared goal and



Philippine Normal University

The National Center for Teacher Education

vision, and involving technology along with delivering authentic professional development.

Taylor in Greener (2010) relates that in order to achieve success in an organization managers have develop a science which will improve the man's work and replace the old rule of thumb method by applying similar standards to all work and ensure that everyone adheres to the standard; scientifically select, train and develop workman. He added that managers must heartily cooperate with the men so as to ensure that all work is done in accordance with the principles which have been developed. Moreover, there must be equal division of work and responsibility between the management and the workmen.

Creating and environment which could nurture the growth of individuals in an organization is one of the enabling cores of managerial leadership. The challenges to find ways in developing human resource are critical to leadership. Topping (2002) offers the critical ingredient to consider in developing human resources;

1. Creating an environment where associates are encouraged to learn and grow.
2. Identifying the most important competencies that associates must develop.
3. Providing the mechanisms for associates to develop those competencies.
4. Generating individual development plans for associates based on their unique sets of skills and deficiencies.
5. Integrating development into the day-to-day activities as much as possible.



Philippine Normal University

The National Center for Teacher Education

Similarly, he offers three components an effective managerial leader needs to be skillful in developing people; coaching, teaching, and mentoring. As coach, a managerial leader zeroing in on results and developing the performance capabilities. As teacher, it concentrates on helping others to learn and apply new knowledge or skills and as mentor it focuses on a long- term career and personal development. He disclosed that being effective in developing associates being their coach, teacher, and mentor is the hallmark of great leadership from within the managerial ranks.

Hord and Tobia (2012) in their book, *Reclaiming Our Teaching Profession: The Power of Educators Learning in Community* presented the characteristics which would generate powerful professional learning. According to them, this includes creating an atmosphere and context for change, develops and communicates a shared vision for change, plan and provide resources, invest in professional development, check progress, and give continuous assistance.

In the same year, Hargreaves and Fullan emphasized that professional learning communities need architecture or design they are going to be productive. They have to be organized and arranged. This statement was supported by Leithwood (2012) that in any circumstances, a principal needs very solid team building skills- skills that build teachers capacity to work together collaboratively.

Zagarac (2012) added that in order for the teachers in a purposeful way, their commitment to their work, teachers' feeling of cohesion among themselves



Philippine Normal University

The National Center for Teacher Education

including positive school climate, really depend on having clarity about the focus of their work and their role in it.

Tobia and Hord (2012) argue that the movement called professional learning communities must become the norm in every school and that this can only happen if the leadership of the school supports it and creates working conditions in which professional learning communities can flourish.

McEwan (2003) asserts that highly effective principals know how to help staff, students, and parents explore problems, confronting difficult issues, and consider possible solution. They use communication strategy as needed.

In the proposed program package in enhancing the managerial skills of academic chairs on D. C run institution studied by Namit (2013), she found out that the faculty development was considered as one of the strengths in the managerial functions and responsibilities although its total quality assurance was partially attained. She surfaced in her dissertation that this finding was evident as the academic chairs served as role model and mentors to the teachers. Moreover, large part of managerial activity involves communicating, holding dialogues and conference and coaching to faculty members. It was clear that effective managers communicate clear expectations to faculty about plans, policies, and programs of the school.

Similarly, bringing teachers together to learn in a workshop or in-service course almost requires some money and certainly requires time. Dealing with time



Philippine Normal University

The National Center for Teacher Education

and money when implementing school change is essential however due to some financial constraints the teachers are facing difficulties in attending seminars which require money. Thus, the following are the recommendations to efficiently use time and save money for staff development:

1. Use faculty meetings for short- term staff development opportunities.
2. Take more time for small complex and sophisticated material.
3. Negotiate for staff development in your teachers' agreement or contract.
4. To reduce costs, use faculty meeting time whenever possible.
5. Use after school time- evening, weekends, or vacations- whenever possible.
6. Give in service credit.
7. Use released time.
8. Schedule a group activity.
9. Consider a school- university partnership.

Teachers who demonstrate the content knowledge and instructional skills are necessary to challenge and motivate students to high levels of learning are recruited and supported through professional development.

The US Department of Education (1997) identified ten principles of high quality professional development that reflect research based practices. High quality professional development focuses on teachers but include all other members of the school community; focuses on individual, collegial, and organizational improvement; respects best available research and practice in teaching and learning; enables teachers to develop further experience in subject content, teaching strategies,



Philippine Normal University

The National Center for Teacher Education

uses of technologies, and other essential instructional tools; promotes continuous inquiry and improvement embedded in the daily life of the schools; support collaborative planning by those who will participate in and facilitate professional development; set aside time and other resources; follows a coherent long term plan; and evaluates the impact on teacher effectiveness and student learning to guide subsequent professional development effort.

A study by Wenglinksy (2000) investigated the influence of professional development classroom practices, and teacher input on student achievement. The study showed that classroom practices had the highest influence, followed by professional development.

Porter et. al (2000) stress that professional development emphasized specific strategies for teaching higher order thinking skills increased teachers' use of strategies in the classroom. Effective professional development was consistent with teachers' goals and available materials; tied to reform rather than to conference participation or workshops; and was of a longer duration. Collective participation by a group of teacher who taught similar grades or subject matters also appeared to have positive effects on instruction.

Newmann et.al (2001) found the professional development is most likely to impact organizational capacity if it is comprehensive and not just focused on acquisition of skills and knowledge. A comprehensive approach included



Philippine Normal University

The National Center for Teacher Education

consideration of knowledge, skills, and dispositions of staff members, program coherence, professional community, technical resources, and principal leadership.

NISMED (2003) reveals that the usual approach to training is providing teachers with new knowledge and procedures which the trained teachers can be used in the classroom to improve instruction. In other words, after the training, the trainee is expected to find uses for what has been learned in the purpose of improving a school's effectiveness. Unfortunately, this way of training seldom works. Without a supportive school environment, it rarely changes the way teachers do things. If the teachers do not find encouragement and motivation to apply the new learning upon return, the tendency is to revert to the old practice.

Partnership Building

In the increasing accountability of the schools in improving the delivery of education, the issue of developing partnership has been seen as one of the important ingredient in achieving the mandate of 1987 Constitution which guarantees the right to education of every Filipino. It provided that,

“The State shall protect and promote the right of all citizens to quality education at all levels and shall take appropriate steps to make education accessible to all.”

The decentralization of the basic education empowered the school heads to exercise their managerial and leadership skill in communicating the mission of the school to the communities it served. Similarly, RA 9155 “Governance of Basic Education Act of 2011” encourages the (j) establishment of school and community



Philippine Normal University

The National Center for Teacher Education

networks and encouraging the active participation of teacher organizations, non-academic personnel of public schools, and parents- teachers- community associations; (k) accepting donations, gifts, bequests and grants in accordance with existing laws and policy of the Department of the purpose of upgrading teachers/ learning facilitator's competencies, improving and expanding school facilities and providing instructional materials and equipment.

The review of literature of San Antonio (2006) connects the importance of participatory management in the success of school improvement. He stressed that involvement, participation, and support of the stakeholders such as parents, community leaders and students are elements needed to improve the school. It also includes helping students who prepared to learn in the school (Dixon, 1996), and staff involvement (Cross and Reitzug, 1996; Hayes, 1996). Similarly, in his study on participatory management, he concluded that the implementation of PSALM through advisory school councils was effective. The effectiveness of PSALM was reinforced by the trust of the stakeholders to the schools.

Involving diverse categories of stakeholders provide benefits to the school (Brown and Cooper, 2000). The study of Henderson and Raimondo (2001) revealed that the active participation of parents have found to be significant towards school effectiveness and student's success.

Genuine partnership involves both parents in contributing to the other. However, many modern schools directly contribute little or nothing to local



Philippine Normal University

The National Center for Teacher Education

community development while expecting local community groups to rally again and again to the defense of the school. This unequal partnership is often reflected in waning community support. This loss of support is especially tragic in those economically distress rural and urban neighborhoods where the school's pool of skills, talent, ability, and insight is desperately needed in the process of community regeneration (Kretzmann and McKnight, 1997).

Golfo (2012) in her dissertation about the stakeholders participation on school- based management found out that the stakeholders in the division of Lucena City were strong in their participation in the activities concerning to quality curriculum development, remedial and enrichment classes, learning at home, youth development program, community services, conduct of livelihood skills, family and community development and engagement and family support. She recommends that the internal stakeholders of various schools must maintain and sustain their strong participation in all the activities in the implementation of school based management. However, the gap in the indicators surfaced which led her to the development of a policy framework which will help to strengthen the participation of stakeholders in school based management.

Sanders (2001) made an assertion that school- community partnership are not without obstacles. The obstacles include insufficient funding, time, and faculty, parent, and community participation. He opined that schools can collaborate with a variety of community partners to plan and implement



Philippine Normal University

The National Center for Teacher Education

partnership activities. In the same line, he summarized that community involvement can equip school to provide students with more relevant, challenging learning opportunities in nurturing environment. The most important selecting partners are identifying community partners and develop partnership activities that will help them achieve goals that support students' learning and school improvement effort.

The survey of NNPS schools helped to generate the categories of partners. These partners include (1) large corporations and small businesses; (2) universities and educational institutions; (3) government and military agencies; (4) health care organizations; (5) faith-based organizations; (6) national service and volunteer organizations; (7) senior citizen organizations; (8) cultural and recreational institutions; (9) media organizations; (10) sports franchises and associations; (11) other groups such as fraternities and sororities; and (12) community volunteers that can provide resources and social support to youth and schools

In a survey research conducted by the National Network of Partnership Schools in 1998 in 443 school members of revealed much about the focus of schools' partnership efforts. Overall, most schools reported that their community partnership activities were student-centered. This finding suggests that schools may focus their partnership activities too narrowly. Schools may not have fully explored collaborative activities to benefit the total school program or to assist in providing adults in students' families with primary services, skills training, or other parental



Philippine Normal University

The National Center for Teacher Education

supports. Such school- and family-centred partnership activities might be especially important for high-need/resource-poor schools.

The community-centred category was the least represented of the four, indicating that many schools had not developed partnership activities that served the larger community. Developing two-way or reciprocal school-community partnership activities is a key challenge for schools as they work to improve and expand their programs of school, family, and community partnership (Epstein, et al., 2002). Through community-focused activities, schools, families, and students can contribute to the larger community, and serve as catalysts for community action and development.

Cushing and Kohl (1997) identified three barriers to successful school-community collaborations: (a) fear of public scrutiny, (b) staff burnout, and (c) teachers' and administrators' negative perceptions of students' families and communities. Mawhinney (1994) and Epstein (1995) also identified barriers to effective collaborations with the community. According to them, one of the most pervasive hindrances to collaboration is territorialism, or, as Crowson and Boyd (1993) noted, "unresolved issues of information sharing, resource mingling and professional turf."

The survey data gathered from 443 NNPS school members highlighted additional barriers to the successful implementation of school-community partnerships. When asked what obstacles they faced in developing and expanding their community partnership activities, 233 schools responded. Only 18% of these



Philippine Normal University

The National Center for Teacher Education

respondents reported that they faced no obstacles in planning and implementing partnership activities. Most reported several obstacles including insufficient participation, time, community resources, leadership, funding, communication, and focus. In this section, I briefly discuss these obstacles and recommended strategies to address them.

Educators have long recognized the importance of establishing and maintaining links with the families of their students. The effectiveness of these efforts is borne out in the country. Effective schools seek relationships with parents and community (Fullan, 2000); Fin (1998) argues that school must foster programs and develop school cultures that encourage parental involvement.

According to Epstein and Connors (1994), the following activities promote parental involvement at school and home: parental involvement, communication between school and home, volunteering, learning at home, shared decision making, collaborative with the community.

Research revealed that parental involvement is one of the most significant factors contributing to a child's success in school. When parents are involved in their children's education the level of students' achievement increased. Students attend school more regularly, complete more homework in a consistent manner, and demonstrate more positive attitudes towards school. They also are more likely to complete high school. Parental involvement helps a child succeed in school and later in life. To ensure parents are informed about and involved in their children's education, schools must foster partnerships with parents. Because parental



Philippine Normal University

The National Center for Teacher Education

involvement is one of the most significant factors in a child's success, it is crucial that all schools set a goal in their improvement plans for increasing it.

The study conducted by the Northwestern University (1997) in United States found that school leaders repeatedly call upon the local community leadership to join schools in solving crises particularly in fiscal and legislative crises unfortunately, they found that partnership is weakening. One of the reasons is that often it is not a partnership at all. Along this thought, they reiterate that genuine partnership involves both partners in contributing to the others. Little or no contribution to local community development and partnership is often reflected in waning community support. This loss of support is especially tragic in those economically distress rural and urban neighbourhoods where the schools pool of skills, talents, ability and insight is desperately needed in the process of community regeneration.

School- business partnerships are a cost- effective strategy for helping students. Building such network takes time and commitment of school staff. But these direct costs are small when compared to the benefit that students received (Bishop and Mane, 2003).

Omalin (2012) developed a proposed guideline in leadership and management competencies of school heads as basis in managing for excellence in the division of Sta. Rosa along fifteen domains which she identified in her study. She found out that the domain community relation and stakeholder partnership was high although a gap from the total quality assurance was recorded. Thus she concluded that enhancement of the said domain is needed.



Philippine Normal University

The National Center for Teacher Education

Tupaz et. al (1995) concedes that collaboration between school and community is necessary in order to make the school more responsive and serviceable to the needs of the people. The collaboration between school and community helps to promote success in education of children.

Financial Management

The multifaceted functions of the school principals heighten their accountability in managing schools and its available resources. Marishane and Botha (2004) coincide that the accountability of a person is measured by the extent to which the decisions taken and resources used succeed in attaining the educational goals.

Clark (2008) asserts that financial management is essential for school principals because it enables them to gain knowledge and understanding on the basic process involved in managing school accounts, the budgeting processes and the systems and controls that are necessary to ensure that the school's monies are not misappropriated. Similar view was asserted by Momoniat (2008) when he explains that financial management is a requirement of a manager in taking responsibilities for the actions and achievement in exchange for greater managerial discretion over their inputs. Thus, managers have to take responsibility for their performance.

Van Wyk (2004) opines that the objectives of the financial management in public sector is to support management in the allocation of limited resources with the purpose of ensuring economy and efficiency in the delivery of outputs required to achieve desired outcomes that would serve the needs of the community.



Philippine Normal University

The National Center for Teacher Education

According to Mestry (2004) as view supported by Clarke (2008) the governing body of every public school must ensure that there are proper policies and procedures in place for the effective, efficient, and economic management of the school finances and the school governing body must also have systems in place to monitor and evaluate the correct implementation of the policies and procedures and to report thereon. The finance policy is arguably one of the most important policies that a school governing body is to put in place.

Clarke (2008) states that one of the main purposes of the school financial policy is to put into place a system of controls – check and balance- to ensure that the school finances are safeguarded and correctly managed. One of the more important controls is a system of internal checks whereby the work of one person is checked by another and there is a clear segregation of duties.

Financial Management in Education

One of the core duties and responsibilities of the school principal is to manage the school's finances and apply the necessary controls to maximize the use of funds available and to account for all spending. Mestry (2004) states that principal, by virtue of his position, plays a dual role: one who is responsible for the professional management of the school and the other as a member of the governing body.

Education must be financed and that it is the astute and effective management of this finance that will allow a quality educational provision to be delivered. As stated by Caldwell and Spinks (1992) "a self- managing school is a



Philippine Normal University

The National Center for Teacher Education

school in a system of education where there has been a significant and consistent decentralization to a school where a level of authority to make decisions related to the allocation of resources”.

All public sector organizations, including education authorities have similar requirements to business organization to publish accounts of their use of public funds and to conduct audits. They have to draw up their budgets for educational expenditures according to strict rules, in particular where they are subject to formula funding (Hough, 1993).

Effective financial management in schools require an appreciation of the significance of costs. It is not possible to make judgement about competing claims on resources without knowledge of the costs of all the activities under consideration. Educational costing is well established in the USA where “the activity of costing is best defined in terms of its purpose or outcomes (Burton, 1999). According to Hans (1996), costing systems can be descriptive, telling administrators how much a given activity or process costs, and second they can be predictive, suggesting how resources ought to be combines in the future for cost effective use.

Financial planning can be viewed as a framework within which managers anticipate future events, develop plans of actions and estimate future revenue. Planning prevents waste if resources as it enable the management to determine the chance of doing business venture before committing any valued resources. Creating an annual business plan is the tasks of evaluating strength, weaknesses,



Philippine Normal University

The National Center for Teacher Education

opportunities, and threats to build organizational priorities (Solllenbergers and Schneider, 1996).

A financial plan common to most organization is the budget. It sets a plan of actions for future. This plan of budget also motion management to achieve and create a basis for evaluation actual results. A budget is a tool for planning well in controlling operation of business. Budget should be prepared as it serves as (1) formalize the planning process, (2) create a plan of action, (3) create a basis for performance evaluation, (4) promote continuous improvement, (5) conducts and integrate management efforts, (6) add in resources allocation, and (7) create an aura of control.

Crisp et.al argue that budget holders must operate within a well define and clearly understood system of control and act in ways which serve corporate objectives. They state that budget holders are expected to: use their delegated powers to further the objectives of the institution as set out in the strategic plan; provide the information necessary to enable the institution to monitor their financial decisions and actions, and be ready to justify these decisions and actions if called upon to do so. Exercise their discretion within the total resources allocated to them and do nothing which commits the institution to on-going expenditures above the agreed in the budget; act lawfully and abide by the terms of national and local agreement and other contracts entered into by the institution.



Philippine Normal University

The National Center for Teacher Education

Levacic (in Coleman and Anderson, 2000) presented a cyclical system on how financial resources reinforce the vital point that finance is important as a means of supporting educational objectives, such as high quality teaching and learning.

Kevin Mc Alessese's in his presentation about budgeting in schools provides an analysis on budgeting. His argument about budgeting includes that (1) resources are 'scare' and you can't do everything you want to; (2) you are accountable for the funding you receive; (3) you want to ensure the things you need to do are properly resourced; and (4) you want to plan ahead.

Internal or department budgeting within an educational organization is one of the most important activities in the resource management cycle. The budget is the tool for ensuring the resources required for the educational activities that lead to the achievement of educational objectives are made available. The budget is much more than a spreadsheet itemizing income and expenditures under different sections heading. It should be used as a means if expressing school aims and educational priorities in financial terms.

At its most effective, budgeting is an integral and flexible component of the educational planning cycle. It goes beyond pure monetary analysis to ensure the resources necessary for the educational activity of the institution are made available. Also it will contain both short and long- term planning elements to allow for both immediate and future resources investments over a number of years to be accounted for. The literature reflects a general consensus that effective practice requires the



Philippine Normal University

The National Center for Teacher Education

integration of financial, staff and curriculum planning and that the aims and objectives of the schools as reflected in the curriculum should drive the budget rather than the other way around (Levacic, 1992).

Anderson et.al (2002) comments that much of the budgetary process is best understood by reference to an example of an educational budget. Understanding of the applications of the budgeting process can be best appreciated when approached through a particular context. Budgetary system can be presented in terms: integrating within the overall management planning cycle; ability to facilitate both long and short term financial planning (contingency funds and the constraints on long- term planning); the level of consultation and participation within a process; the degree of decentralization of the decision- making process; and sufficient flexibility to encourage innovation and to allow for change.

Levacic (1993) claims that budget has four functions that enable it to transform finance into real resources. These functions are; planning and decision-making; control; accountability and stewardship; and motivation. This can be linked to the school management tasks identified by Clark (2007) namely; planning, organizing, leading, and controlling. The administration of a school's finances is an integral part of effective school administration (Mestry, 2004; Ntseto, 2009).

Planning is a vital component of effective school financial administration (Du Preez et al. 2003). The planning of school finances usually begins with the drafting of a budget (Kruger 2005). According to Bisschoff (1997), a budget is the



Philippine Normal University

The National Center for Teacher Education

mission statement of the school expressed in monetary terms. McKinney (1995) argues that budgeting is an on-going and dynamic process that is typically marked by regular phases, such as, planning, needs assessment and priority setting. Budgeting is a forward-looking process which should be guided by the school's vision for the future and a realistic assessment of the risks (Clarke 2007; Du Preez et al. 2003). Bisschoff (1997) summarises the purpose of a budget as assisting systematic planning; quantifying objectives and identifying priorities; coordinating activities and communicating plans within the organisation; motivating and increasing the accountability of middle management; authorising expenditure and activities; controlling, monitoring and analysing expenditure; and evaluating performance. In an education organisation its financial administration activity means bringing all possible input from staff, parents, students and the community together to render the service of quality education (Bisschoff 1997). In this respect, *organising* of school finances should include aspects such as drawing up a school financial policy; setting up a structure within the school to handle administrative and financial matters; delegating certain functions to clerks, class teachers and the treasurer; and coordinating activities (Kruger 2005; Ntseto 2009).

Leadership in financial administration involves three aspects: sound relationships, communication with all stakeholders and internal as well as external and motivation of all the people concerned with school finances (Bisschoff 1997). Bisschoff (1997) notes that "harmonious collaboration between academic and administration staff is a prerequisite for successfully achieving financial objectives".



Philippine Normal University

The National Center for Teacher Education

Niemann (1997) believes that financial activities are dealt with most effectively when both the administrative and academic personnel are involved in the process. Communication is the basis for establishing relationships and for providing motivation (Niemann 1997). Bisschoff (1997) argues that good communication will ensure that each staff member who is involved in school finances would be informed about authorisations for various expenditures, is knowledgeable about the financial procedure for expending money, and knows to whom the results of the expenditure should be reported. Bisschoff (1997) emphasise that all staff members should feel that they have a role to play in all of the school's activities, as this will motivate them to work hard and consequently achieve effective and efficient financial administration.

The financial planning of school finances and its *control* are interdependent and closely linked with each other (Ntseto 2009). It can be deduced that the same relationship exists between the budget and control since a "budget is a planning instrument" (Bisschoff 1997). This means that financial planning is about budgeting and in this regard Ntseto (2001) argues that a "budget is a financial control technique as well as a plan".

Kratz et. al (2001) forwarded that leadership is having a vision, setting goals , providing directions, planning, organizing, and allocating resources, among other things. Successful leadership demonstrates ability in these areas, but budgeting also requires these abilities. Educational leaders responsible for the budgeting process, or parts of it, must exert leadership by sharing their vision for the organization, by



Philippine Normal University

The National Center for Teacher Education

establishing and communicating goals, and by making plans for the future realization of their vision and goals. They have to establish organization and communicate ideas, plans and concepts of allocation and control. They must provide direction. The budget development process requires this kind of leadership.

Cattanach (1996) points out that leadership is easier to recognize than to define and added that effective leadership articulates commonly held values and beliefs, develops shared commitments to common goals, and inspires others to do what they ordinary wouldn't do. The latter supports the concepts of budgeting being viewed as leadership. Budgeting is and should be goal oriented. The budget development process and the resultant budget are tools in translating vision into reality. The leaders who envision increased students opportunity or better student facilitate or higher level of educational quality uses budgeting process to lead toward the reality he or she sees as translation of that vision.

Hartman in Kratz et. al (2001) writes that budgeting is for planning, public review and approval, justification of public funds expenditure, control, and fiscal performance evaluation. Budgeting then, provides the public school with planning process that is of great practical value to the staff and administration all year and prompts planning in other areas- curriculum, purchasing, facility maintenance, and development. This includes assessment of need and goal determination; program evaluation; required approval of the recommended revenue and expenditure plan; expenditure justification and control; evaluation of fiscal performance. Moreover,



Philippine Normal University

The National Center for Teacher Education

thorough and sensible budgeting will provide vehicles for achieving these purposes but certainly not automatically. Administrators who choose to ignore the tenets of good management of leadership, budgeting will not serve its purpose.

Mejorada (1999) opined that the functions of financial management are threefold; allocation of financial resources, procurement of fund, and the efficient and effective utilized of financial resources.

Fuellas (2003) coincides that financial resources of the school are very essential in operating its different activities. It must be priority concerns of the managers to allocate adequate financial resources are maintained to support development program in facilities and personnel. The desired level of competencies of school manager is managing financial resources of the school.

In the Philippines, the Department of Education released an order on implementing guidelines in the utilization and allocation of the maintenance and other operating expenses (MOOE). The fund is released to the school heads (Elementary and Secondary) to fund activities as identified in the approved School Improvement Plan (SIP) particularly in improving learning outcomes. This also allocated to pay expenses for utilities and procurement of school supplies necessary in classroom teaching. It also includes payment salaries for janitorial and security services and the use for other mandatory expenditures except for the procurement of textbooks and other instructional materials, and school furniture and equipment (DepEd Order No. 60, s. 2011).



Philippine Normal University

The National Center for Teacher Education

Similar to this, the Department of Education reiterated the responsibility of the school heads in the secondary schools implementing the special science program on the proper utilization of funds which is subject to the usual accounting and auditing rules and regulation. As strictly implemented, the fund is only allowed to spend in the provisions approved by the department called “object of expenditures” which must reflected in the Schools Improvement Plan (SIP).

The different guidelines issued for the implementation of the program provides clear directions to the school heads on the proper utilization of funds. Therefore, as stated in the compelling statements above, school heads must be prudent enough in managing resources which are entrusted to them.

UNESCO (2000) disclosed that the mismanagement of funds by the principals often leads a shortage of critical resources in schools as money is not available for the purchasing of the necessary equipment and books.

On top of these, Wyk (2004) states that the implementation of sound financial management principles is hindered due to various managerial shortcomings which include but are not limited to: lack of skilled and qualified staff; responsibilities not being defined; lack of training; lack of structured policies and procedures; outdated accounting and information systems; inadequate control systems; the poor flow of documentation and information; and non-integration between budgets and strategies. He grouped the shortcomings in three categories; inadequate and unknowledgeable staff; poor integration of budgets and strategies,



Philippine Normal University

The National Center for Teacher Education

and outdated control and reporting systems and suggests that financial management will only be effective if: line managers are competent and committed, outcomes based budgeting in applied and accrual- based reporting is introduced into the public sector.

In the discussion paper prepared by Maligalig and Albert (2008) they assessed the basic education in the country in view of the attainment of the second goal of Millinneum Development Goals (MDGs) in achieving primary education. The trends in education indicators for monitoring the goal suggest that the Philippines may probably not meet the target on achieving universal primary education. The findings was related to the inadequate allocation of government budget to support the thrust in providing education for all, much less to improve the quality of education that it can provide.

Paule (2004) conducted a study which looked at the financial management practices and performance of selected private and state university cooperative in Manila and Quezon City. Using a descriptive method of research, she found out that the success of financial management depends on the sound financial planning. He added that without the financial plan provides direction and systematic operations. Her finding further revealed that successful financial management is attributed to the leaders who are well educated and exposed to the theory of good financial management.



Philippine Normal University

The National Center for Teacher Education

Mansibang (2000) disclosed that the important aspect of financial management is the use of working capital funds. The management has the primary responsibilities to make sure that the working capital funds are used and utilized well.

The Department of Education in CALABARZON region recognized the importance that the school heads must be also equipped in financial management. As such, the finance department responded to this need by conducted a budget preparation workshop for the school heads in Tagaytay City which capacitates the school managers in preparing and allocating budget for their respective schools.

Student Support

Danielson (2002) emphasized that a school's learning support system provides extra assistance to students who need it to make satisfactory progress in their learning. As with every aspect of school improvement, the learning support system must support the school's goals for students learning, reflect the school's belief structures, and be consistent with the current research on teaching and learning. These matters are embodied in the philosophy of learning support.

A learning support program is designed to support both teachers and students in their work, to enable all students to be successful and challenged in the school curriculum. It acknowledges that some students need extra time and support in order to learn, and recognize that all students, regardless of their general abilities, may



Philippine Normal University

The National Center for Teacher Education

need additional assistance from time to time. The learning support system is one important manifestation of a school's success orientation, and sends a message that failure is not tolerated.

The Magna Carta for Students provide some rights of students in school guidance and counseling services to help them make decisions and select the alternative in field of work according to their potentials and the right to adequate, safe and clean housing facilities within or near the school campus (Falogme, 2011).

Gonzales (1994) conducted a study in the status of laboratory facilities and equipment in secondary schools in Mindanao State University. The laboratory facilities and equipment were analyzed based on the minimum requirements on laboratory equipment and supplies as prescribed by DECS- SEDP. However, it was found out that no schools conformed to the minimum requirements on equipment and supplies.

Falogme (2011) correlates the management functions of the secondary school principals to the student services in the division. He concluded that perceived satisfactory in the students' services to the manifested management functions of the principals. However, total quality assurance was not met due to the weaknesses of the principal in their management functions.

Morris (2004) on the other hand, delved on the importance of library in providing opportunities to the learners in acquiring content and information literacy.



Philippine Normal University

The National Center for Teacher Education

The library serves as a place where students can do in depth independent work, use computers, equipment and research materials.

On Tracking of Students

Since the turn of the 20th century, schools have placed students in different classes based on perceived ability (Kliebard, 1995). The asserted purpose is to tailor the rigor and pacing of curriculum to meet the specific learning needs of each student (Hallinan, 1992, 1994). However, the empirical results have fallen short of the theory, with evidence that tracking depresses student achievement and brings racial and socioeconomic stratification in schools (Braddock & Dawkins, 1993; Conger, 2005; Gamoran, 1986, 1992; Lipman, 1998; Moore & Davenport, 1988; Murphy & Hallinger, 1989; Oakes, 1990, 1992, 2005; Oakes, Gamoran, & Page, 1992; Slavin, 1987). This short summary focuses on findings in three key areas: track assignment, student achievement, and detracking.

Closely related to tracking are special programs for students identified as having superior intellectual ability or other talents. From state to state, the definition of giftedness varies, with corresponding wide variation in the percentage of students obtaining the label (Bricker & Braverman, 1998). Some jurisdictions limit gifted programs to students with an IQ score of 130 or more—that is, the top 2% of all students (Carpenter, 2001). From 3 to 5% is probably more common, but some expand the definition to include those testing in the top 10% or even wider (Bricker & Braverman, 1998).



Philippine Normal University

The National Center for Teacher Education

Gifted programs respond to concerns, emerging early in the 20th century, that traditional schools ignore the needs of gifted students because they disdain achievement, effort, and merit (Resnick & Goodman, 1994). Today, advocates argue that gifted children have special needs that cannot be accommodated in the regular classroom and that require additive and special resources above and beyond general education programs. Many see a separate, homogenously grouped classroom setting, as well as the enriched curriculum, as essential to meet gifted students' needs (Gallagher, 1994).

Generally, gifted education programs are pull outs (Olszewski-Kubilius & Limburg-Weber, 1999), wherein students leave the classroom weekly for several hours. Such programs are intended to provide an environment where gifted peers can interact and experience accelerated content and skill mastery. Alternative structures include clustering, multigrade classrooms, and differentiated instruction in mixed classrooms. In-class clustering of gifted students is intended to accommodate students' needs for advanced curricula without removing them from their heterogeneous classroom.

Few studies have assessed this strategy, but reviewers conclude the effect is positive (Kulik & Kulik, 1990). Advocates for multi age grouping for gifted students claim that it combines the benefits of high intellectual engagement with cross-age interaction (Lloyd, 1999). Evidence about the effectiveness of these strategies is



Philippine Normal University

The National Center for Teacher Education

mixed; some reviewers claim benefits (Vaughn, Feldhusen, & Asher, 1991), and others do not (Delcourt, Loyd, Cornell, & Goldberg, 1994).

Differentiated instruction in mixed-ability classrooms offers a seemingly practical way to accommodate the special needs of students identified as gifted, particularly in standards based schools (Tomlinson, 2001; Tomlinson et al. 2003; VanTassel-Baska & Little, 2003). Teachers develop an understanding of the differences among their students and adjust their teaching practices to ensure that all students are equally engaged and valued (Tomlinson, 2001).

The work of Endriga which was presented in the assessment handbook (2013) supported that assessment is vital in any educational program. The K to 12 curriculum also spelled out holistic assessment process, which is guided by the set content and performance standard. Several levels of assessment are involved in each of the subject are to gauge a student's ability and capability.

In the descriptive survey research conducted by Balagtas et. al. (2010) on the literacy level of educational assessment of students in a premier teacher education institution revealed that the most critical role that teachers perform in the classroom is being an assessor of student's learning. The results of their assessment to students could either make or break their students' future.

The findings revealed that the undergraduate and graduate students in the teacher education programs are weak in administering, scoring and interpreting the



Philippine Normal University

The National Center for Teacher Education

results of both externally- produced and teacher- produced assessment methods; using assessment results when making decisions about individual students, planning instruction, developing curriculum, and improving schools; developing valid student grading procedures; communicating assessment results to students, parents, other lay audiences, and other educators; and recognizing unethical, illegal and other inappropriate methods and uses of assessment information.

In addition to these five weak areas, the undergraduate students are also weak at choosing assessment methods appropriate for instructional decisions, which is an area of strength of the in-service teachers surveyed. It is unfortunate that all the non-education degree holders who are earning units in education so that they could qualify as teachers of their discipline are weak at all areas of assessment literacy.

In the Philippines, Balagtas and Ferido (2007) revealed that teachers need training on assessment. This problem was viewed also by Department of Education when the department introduced alternative assessment which necessitates the use of rubrics and portfolios and other alternative methods of students' assessment.

In the tracer study conducted by Santos (2004) she assessed the effectiveness of the Chemistry program based on the professional success of the alumni. Using a questionnaire and descriptive design using correlational procedure, she found out that the alumni were very satisfied in the effectiveness of the vision, mission, and goals of the college, laboratories and equipment. They were satisfied with the



Philippine Normal University

The National Center for Teacher Education

curriculum and instructions, faculty, library, community extension services, physical plant and facilities, organization and administration.

Based on the perceived weaknesses of the program, an enhancement which supplements the existing program was proposed. The key area focused on the weak point is the curriculum which needs enrichment. She recommends that to contribute to the professional success of the graduates, management support is needed in improving the performance of the graduates, select, update and develop faculties, and more updated and modern laboratory and facilities

Fortales (2011) in her dissertation on the tracer study on stakeholders of excellence among graduates of Bachelor of Science in Agricultural Engineering in a state university. The results of her study led her in developing enhancement program. She recommends that management staff should give attention and efforts to enhance the program areas especially those with low quality like libraries and equipment, library, and students services, the administration leadership of the school. Revisit monitoring practices in the implementation of the program to have common points of visioning program assessment among stakeholders.

The curriculum and instruction elements of the program should address the difficulty in communicating skills and the use of technology package in agriculture. The leadership of the school should sustain the accreditation of its various program offerings towards total quality standard of the management.



Monitoring and Evaluation

As experience implementing comprehensive approaches grows, so does the need for streamlined and systematic monitoring and evaluation (M & E) to determine what is being achieved and how the response can be improved. Data derived from these efforts serve to provide a feedback loop to those responsible for both management and implementation of the programme activities.

UNESCO (2012) defines monitoring involves the assessment of the progress made toward achieving a programme's goals and objectives. It includes the number of people reached, number and types of resources used, and other measures that show the completion of planned activities.

Evaluation differs from monitoring in that it assesses how well a programme achieves its short-term outcomes and long-term impacts. Evaluation determines whether or not, and how well, the objectives of a programme are being met. This work is usually done at the programme's conclusion, but it is often the first step that is planned when putting together an M & E system.

Salis (2002) forwarded that to ensure quality in a system it needs a feedback loop. Mechanisms must be in place to ensure that outcomes can be analysed against the plan. Monitoring and evaluation are key elements in strategic planning. If the institution is to be learning rather than a static organization, a process of evaluation and feedback must be an essential element in its culture. The evaluation process



Philippine Normal University

The National Center for Teacher Education

should focus on the customer, and explore two issues: first, the degree to which the institution is meeting the individual requirements of its customers, both internal and external; and second, how far it is achieving its strategic mission and goals. To ensure that evaluation is monitoring both individual and institutional goals, it must take place at three levels:

- *Immediate*—involving the daily checking of pupil/student progress. This type of evaluation is largely informal in nature, and is undertaken by individual teachers or at the team level.

- *Short-term*—requiring more structured and specific means of evaluation, which ensures that pupils/students are on track and are achieving their potential. Its purpose is to make certain that things that need to be put right are corrected. The use of statistical data and student profiling should be features of this process. It is undertaken at a team and departmental level. Short-term evaluation can be employed as a method of quality control to highlight mistakes and problems. The emphasis is on corrective action to prevent, so far as is practical, pupil/student failure or under-achievement.

- *Long-term*—an overview of the progress towards achieving strategic goals. This is mainly institutional-led evaluation. It requires large scale sampling of customer attitudes and views, as well as monitoring by a range of institutional performance indicators. This type of evaluation is undertaken as a prelude to updating the strategic plan. It can involve the use of questionnaires to gain feedback



Philippine Normal University

The National Center for Teacher Education

from both primary and secondary customers. The information gained from surveys can be cross-referenced with quantitative performance data on successes, pass rates, student destinations, etc. An important purpose of this type of evaluation is prevention: finding out what has gone wrong, and what pupils/students have not benefited from, and then preventing it from happening again. It is a checking mechanism to ensure that continuous improvement initiatives are meeting their objectives.

The function of evaluation at each stage is different. Too often evaluation is seen as having *prevention* as its main purpose. It is a means of discovering what went right and wrong and using the information to improve things next time round, which in education usually means next year. Preventing things from happening again is a perfectly valid use of evaluation, but it has a major drawback. It does not put right the things that have gone wrong for this year's pupils and students. If problems are identified there must be mechanisms to correct them immediately. Pupils and students should not be allowed to suffer. Putting things right next year will not help them. They need *corrective* action to improve their learning or to stop them under-achieving or failing. A primary purpose of evaluation is to ensure that students are on target, and if they are not, to take the necessary actions to guarantee that they reach their goals. Unfortunately, evaluation is too often used to improve future rather than present provision. The failure to distinguish the long term from the short term has led to evaluation mechanisms being employed in possibly misleading ways.



Philippine Normal University

The National Center for Teacher Education

The Educational Facilities Manual of DepEd (2010) states that monitoring and evaluation (M & E) are important managerial tools for planning, decision making, reviewing past actions, problem solving and improving future actions. Specifically, M & E facilitates organizational performance, measurement in terms of efficiency, effectiveness, economy and impact. M & E charts the progress of the organizations as they try to realize those performance measures.

A good M & E must always respond to the stated goals and objectives of the institution. It must monitor how the organization moves towards those objectives and evaluate to what extent it has achieved those objectives. The evaluation of the educational facilities involves the appraisal, assessment, or measurement of its condition, development, improvement, and maintenance. It shall be based on prescribed criteria, requirements, or standards which constitute the rules or tests upon which judgment or decision can be made.

Monitoring and Evaluation are essential aspects of the administration of educational facilities. They provide proper directions and guidance for the intelligent and efficient administration of the educational facilities. They serve as potent managerial tools for promoting and achieving quality and effectiveness in educational outcomes. Monitoring consists basically of the development of data collection and reporting system that provides the necessary information to assess the progress in the delivery and attainment of program or project goals. Monitoring is a continuous task. On the other hand, evaluation deals with the analysis of the



Philippine Normal University

The National Center for Teacher Education

quantitative and qualitative information collected in the monitoring activity and in the making of judgments and decisions based on the analysis.

Monitoring is an on-going function that uses the systematic collection of data related to specified indicators to provide management and the main stakeholders of a development intervention with indications of the extent of progress and achievement with regard to expected results and progress in the use of allocated funds. It provides an early indication of the likelihood that expected results will be attained and provides an opportunity to validate programme theory and logic and make necessary changes in programme activities and approaches. Monitoring provides essential inputs for evaluation and is therefore a part of the overall evaluation process.

Evaluation is a systematic and objective assessment of an on-going or completed policy, programme or project, its design, implementation and results. The aim is to provide timely assessments of the relevance, efficiency, effectiveness, impact and sustainability of interventions and overall progress against original objectives. Evaluation essentially concerns the following questions: Are we doing the right thing? Are we doing it right? Are there better ways of achieving the results?

The general purposes of evaluation in education are to improve the performance of the programme in meeting its objectives, and to provide a basis for accountability to donors, stakeholders and the general public. Specifically, evaluation aims to improve the relevance of the programme, to enhance the achievement of results, to optimize resources use and to address issues of target



Philippine Normal University

The National Center for Teacher Education

group satisfaction. With appropriate stakeholder participation, an evaluation can promote dialogue and improve cooperation between partners and participants. With appropriate dissemination, it can also contribute to learning and knowledge-building and may also benefit to other partnership programmes. Ultimately, evaluation helps multi-stakeholder partnerships for education continuously improve their performance and maximize their impact (UNESCO, 2007).

A monitoring and evaluation system should be regarded as a long-term effort which requires a strategic commitment from the outset. At the heart of a robust monitoring and evaluation system lies its utility. A number of components are critical in working towards a sustainable monitoring and evaluation approach, which apply equally to multi-stakeholder partnerships for education as to any other type of development partnership.

- **Demand:** If demand is haphazard, results-based monitoring and evaluation systems are not going to be used.
- **Clear roles and responsibilities:** The organizations and people who will be in charge of collecting, analysing and reporting performance information must be clearly defined.
- **Trustworthy and credible data:** Debate on key issues must be backed up by trustworthy and credible information, otherwise only presumptions can be made.
- **Accountability:** Problems as well as successes should be acknowledged and addressed.
- **Capacity:** Sound technical and managerial skills are necessary for the sustainability of monitoring and evaluation systems and may have to be developed through training and external help.
- **Incentives:** Success needs to be acknowledged and rewarded, problems



Philippine Normal University

The National Center for Teacher Education

need to be addressed, and messengers carrying bad news should not be punished.

Continued upgrading and improvements is important to sustain effective monitoring and evaluation systems for multi-stakeholder partnerships. For this reason, monitoring and evaluation systems themselves should be evaluated periodically, using internal or external evaluators.

UNICEF (2006) on the other hand, specifies that the objectives of monitoring and evaluation vary, depending on the type of programme or project. Generally, the purpose is to assess the effectiveness and efficiency of the programme and its efficacy in relationship to the original expectations. Monitoring and evaluation also depend on who is the end user and what are the expectations of the endeavour. An end user may simply be interested in knowing if the programme delivers on its objectives.

Monitoring and evaluation should also be a means of driving forward the dynamic process of change while keeping track of progress in effectiveness, efficiency and impact. Schools as institutions should be engaged with the monitoring and evaluation process, not only to provide answers to authorities but also to improve their own practice. Teachers, pupils and school administrators should be fully engaged in the process, not simply involved in filling out questionnaires or being interviewed. Monitoring and evaluation should take full account of their roles as principal actors who need to learn from their own practices in order to reflect and make changes that improve those practices.



Philippine Normal University

The National Center for Teacher Education

In Africa and Asia, versions of Collaborative Action Research in Education (CARE) have been used successfully to engage teachers and school managers as genuine partners in monitoring, evaluation and research exercises. In this regard, great value has been attached to the unique experience and insight teachers bring to such exercises. Most teachers experience a professional transformation through their involvement with action research and go on to become more reflective in their own classroom practices. They tend to seek professional knowledge. Evaluation and monitoring must be presented to communities in a comprehensible manner if they are to participate meaningfully in the process.

In the Philippines, the accreditation system for basic education is with the principle that it certifies process that looks into essential areas of school operations and they conform to the quality standards. The standards have been established through consensus of stakeholders of basic education. To be accredited, a school must show sufficient and compelling evidence that it is achieving its avowed purposes, conforming to PASBE standards, and implementing the recommendation of the National Accreditation Board.

The PASBE aims to (1) provide opportunity to schools with potential to improve the quality of their organizational practices and learning outcomes through continuing self- assessment and peer review, (2) encourage national implementation of PASBE standards for quality basic education, (3) strengthen partnership of DepEd within national organization of private and public elementary and secondary school heads to facilitate accreditation of deserving schools, and (5) consolidate the best



Philippine Normal University

The National Center for Teacher Education

practices of accredited schools and utilize them for the continuous upgrading of the PASBE standards.

DiClemente and Prochaska (1994) stressed that evaluation is an integral part of the educational programming process. To make evaluation useful in program improvement, the evaluation plan should be drawn at the beginning of the program. Program planning and evaluation are interconnected activities of the program cycle. It starts with the needs assessment of the target participants. Prioritizing needs leads to defining program objectives. Once program objectives are defined, program development takes place.

Educational materials and activities are planned to achieve objectives and meet participants' needs, while parallel to this process, evaluation is planned as a guiding tool to determine whether the program achieves its objectives. When the program is ready to be delivered, the evaluation plan should be in place to allow easy collection of impact and program/ process evaluation data and information, as well as organic adjustment to the program that facilitate learning.

Finally, by planning evaluation at the beginning of the program, educators would be able to use the collected data to assist with on-going monitoring of the program and make program changes to ensure it achieves objectives. Monitoring program is helpful to maximize the impact and achieve the cost effectiveness of program.

The process of evaluation involves two basic facts: (1) gathering information so that decisions will be informed and supportable and (2) applying criteria to the



Philippine Normal University

The National Center for Teacher Education

available information to arrive at justifiable decisions. The process is done systematically and openly so that others can follow along and all can learn. It is recorded in reports or other documents so that the steps in a decision process about a program can be traced, and, when necessary, the results can be reviewed and communicated clearly and accurately. Evaluation findings are reported in writing so that learning can be shared and made available for future use by others.

Evaluation Approaches

In several countries, policy makers now routinely authorized funds to be used for the express purpose of evaluating educational programs to determine their effectiveness. Thus, program evaluation has come into being as both a formal educational activity and as a frequently mandated instrument of public policy.

Anderson and Ball (1990) viewed evaluation as a contribution to decision about program installation; decisions about program continuation, expansion, or certification; decision for program modifications; obtain evidence to rally support for a program; obtain evidence to rally opposition to a program; for the understanding of basic psychological, social, and other processes.

Many authors agreed that the great evaluation approach in evaluating programs is Daniel Stufflebeam's CIPP evaluation model (Fitzpatrick, Sanders & Worthen, 2011; Mertens & Wilson, 2012; Stufflebeam, 2003; Zhang, Zeller, Griffith, Metcalf, Williams, Shea & Misulis, 2011). In this decision-oriented approach, program evaluation is defined as the "systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments



Philippine Normal University

The National Center for Teacher Education

about the program, improve program effectiveness, and/or inform decisions about future programming.” (Patton, 1997). The CIPP evaluation model is a framework for guiding evaluations of programs, projects, personnel, products, institutions, and evaluation systems (Stufflebeam, 2003).

Malcom Provus developed a discrepancy evaluation model with four components and five stages of evaluation. The four components comprise the (1) determination of the program standard (2) determination of program performance (3) comparison of performance with the standards, and (4) determination whether a discrepancy exists between performance and standards or not. The model suggests that in each of the five stages, it is necessary to compare the performance with the identified standard. The application of the Provus Evaluation paradigm relies to a great extent on the identification of appropriate performance standards.

In the assessment of Biology program of selected science high schools in Metro Manila, Andujare (2009) recommended that periodic evaluation of the effectiveness of the area components of the program be conducted to gauge or monitor its implementation through identification of its strengths and weaknesses. The results of the data can be used as basis for further improvement of excellence as a Science institution.

Garcelo (1997) evaluated the program using descriptive- evaluative type of research using ABCD model of Ochave to determine the intents and actualities of the program for non- science majors. Among the findings, the strengths of the program



Philippine Normal University

The National Center for Teacher Education

were found in the purpose and objectives, faculty relations, professional performance and selection of academic staff. The weaknesses were found in the administration, science faculty development, teaching assignments, salary and fringe benefits and knowledge of the integrated science curriculum. Other weaknesses were curriculum and instruction, laboratories, libraries, and community involvement.

The recommendation includes continuing faculty development program in the form of trainings and seminars and use of the community- based approaches in teaching, community involvement policy to improve the quality of instruction through actual community involvement, and continuing communication among the science faculty administration and librarian to establish a strong science library thru procurement of the recommended science books. The researcher disclosed that this would enable the teachers to cope with the trends and breakthroughs in science teaching.

Jaminal (1999) conducted an evaluation of the arts and science program of the university of Perpetual Help System and the results were became a basis for quality assurance. A descriptive evaluative type of research using the modified model ABCD developed by Ochave was used in surfacing the intents and actualities in the implementation of the program.

The recommendations offer the enhancement of faculty development program in the form of continuing education, in-service trainings, seminars and workshops using different methods, strategies, approaches in teaching relevant to



Philippine Normal University

The National Center for Teacher Education

subjects at the tertiary level. This would enable the faculty to cope with trends and breakthroughs. Undertake substantial plans for continuous improvement and development of faculty workshop, students support and services, physical facilities, procurement of modern book, professional journals and publications, computers, modern equipment, supplies and materials in anticipation of technological and environmental challenges. Lastly, she strongly recommends that continuous establishment of linkages with industry and other colleges in the development of arts and science curricula to make them relevant and adapted to the needs of the society.

Bago (2001) stresses that program evaluation entails the effectiveness of the entire curricular programs as implemented. It requires an analysis of the different components of the educational system. Each component of the system should be analyzed and its contribution determined singly or in combination in relation to the realization of the objectives of the curriculum. The instructional process such as the teaching methods strategies, as well as management process is taken into account as to whether each constrain or promote the implementation of the curriculum.

The literature and studies presented in the study provide insights to the research the interplay of the different components for effective implementation of the program. The literature also showed what others have been written about the nine components presented in the study. However, few local literature and studies have been conducted which assessed the status of implementation and management of the Science, Technology, and Engineering (STE) Program in the Philippines. There were



Philippine Normal University

The National Center for Teacher Education

studies conducted but limited in student achievement and not in the total management of the program. Thus, the researcher found the needs in conducting the study to provide an avenue on status of implementation and management of the program.



Philippine Normal University

The National Center for Teacher Education

Chapter III

RESEARCH METHODOLOGY

This chapter discusses the methodology and processes employed in order to attain the purpose of this study. It includes in particular, the research design, participants of the study and sampling techniques, instruments and its development stages including validation and reliability, data gathering procedure, and statistical analysis for data analysis and interpretation.

Research Design

This study banked on the descriptive research design and development of a management framework as the output of the study. Descriptive research according to Travers (1978) describes the nature of situation as it exists at the time of the study and to explore the causes of particular phenomena; describes and interprets systematically a situation or area of interest factually and accurately. It involves the collection of data in order to test hypothesis or to answer the questions concerning the current status of the subject of the study (Gay in Sevilla et. al., 2004).

In this study, the descriptive method of research was used to gather information which would reveal the implementation of the special science program in the five original secondary high schools in CALABARZON Region. The views of respondents in the implementation of the program were obtained through survey questionnaire.



Philippine Normal University

The National Center for Teacher Education

Development in nature as this study attempted to develop a management framework which would enhance the weaknesses identified in the implementation of the program.

Figure 2 shows the research paradigm of the study. The first box is the input which contains the nine components of the Science, Technology, and Engineering (STE) Program which were assessed by the respondents to determine the status of implementation in the management program namely; management and leadership, curriculum management, student achievement, professional development, partnership building, financial management, support system, tracking of students, monitoring and evaluation.

The second box shows the assessment of the school heads, head teachers, master teachers, and science and mathematics teachers in the implementation of the program. The results of the assessment revealed the strengths and weaknesses in the implementation and management of the program.

The third box shows that based on the result a management framework was evolved. The proposed framework aims to enhance the management and implementation of STE Program in CALABARZON Region.



Philippine Normal University
The National Center for Teacher Education



Respondents and Sampling Technique

The main thrust of the study was to assess the status of implementation of the Science, Technology and Engineering (STE) Program in the five original implementing secondary schools in CALABARZON region. To gather data in relation to the implementation and management of the program, the respondents were purposively selected more specifically it involved the five (5) original public secondary schools in the region offering the special science program identified by the Department of Education.

Purposive sampling technique was employed in selecting the participants in the study following Beins and McCarthy (2012) stating that this technique relies on the judgment of the researcher and a specific purpose in identifying participants because at times the investigators are interested in a particular type of person and do not feel the need to have a random sample. The respondents were chosen based on the following conditions:

1. School heads in the Science, Technology, and Engineering (STE) Program implementing schools identified by the Department of Education.
2. The department heads of science and mathematics.
3. Master teachers in Science and Mathematics who teach the students enrolled in the program.



Philippine Normal University

The National Center for Teacher Education

4. Science and mathematics teachers who are directly involved in the implementation of the program.

Table 1 shows the distribution of participants in five (5) implementing public secondary schools in CALABARZON region.

Table 1

Respondents of the Study

Name of Schools	School Heads	%	Department Heads	%	Master Teachers	%	Teachers	%	total	%
Batangas National HS	1	1.45	3	4.35	2	2.90	12	17.39	18	26.09%
Bucal National HS	1	1.45	2	2.90	1	1.45	5	7.25	9	13.03%
Lipa City Science HS	1	1.45	1	1.45	0	0	4	5.80	6	8.70%
Pedro Guevarra Memorial HS	1	1.45	2	2.90	5	7.25	10	14.49	18	26.09%
Quezon National HS	1	1.45	2	2.90	3	4.35	12	17.39	18	26.09%
Total	5	7.25	10	14.5	11	15.95	43	62.32	69	100%

Research Phases

This study geared towards the development of a management framework to enhance the Science, Technology, and Engineering (STE) Program implementing schools in CALABARZON Region. To achieve this, the researcher adapted the procedure used by Rondilla (2012) in data gathering. The procedure is composed of five phases; (a) planning stage, (b) instrument development stage, (c) content



Philippine Normal University

The National Center for Teacher Education

validation stage, (d) administration stage, (e) development of a management framework.

Phase I. Planning Stage

The planning stage is considered as the most essential part of the study. During this stage, the researcher laid out plans on how the goals of the study will be achieved. It includes the review of available materials pertaining to the program; its history and bases. Issuances and assessment tool issued by the Bureau of Secondary Education were also reviewed to identify the guidelines formulated for the implementation of the special science program. Having reviewed the available materials, the information gathered was presented to the research advisers for their comments and suggestions. The extensive review of available materials and the suggestions given by the research advisers helped the researcher in developing conceptual framework of the study.

Phase II. Instrument Development Stage

After thorough review of literature about management and leadership together with the available memoranda issued by the DepEd, the researcher came up with the nine (9) major areas which served as basis in the development of instrument. The indicators in each area were based on the available literature and dissertations which intend to assess the implementation of the program. The appropriateness of the indicators was initially presented to the advisers and upon the



Philippine Normal University

The National Center for Teacher Education

approval of advisers. The researcher prepared the instrument for the content and judgmental validity of the experts in the field.

A researcher made a survey questionnaire as the instrument of the study. The items included in each area were taken from related literature and available materials which were found appropriate in this undertaking. A table of specification was also prepared in order to identify the number of items in each area.

Johnson (2012) concurs that instrument must be valid. Validity refers to whether a measuring instrument measures what it claims to measure. As with reliability, validity is measured by the use of correlation coefficients but unlike reliability coefficients, there is no established criterion for the strength of the validity coefficient.

Phase III. Validation of the Instrument

To establish the validity of the instrument, the first draft of the questionnaire was presented to the research advisers for their comments and further suggestions. After considering the comments and suggestions made by the advisers, the questionnaire was presented to linguist who has a degree in Ph. D in Linguistics to check the grammar before it was presented to ten (10) experts in the field of educational management. The experts checked the instrument according to its content and appropriateness of the indicators using a likert scale. The four scales with corresponding verbal interpretation were used to guide the validators in



Philippine Normal University

The National Center for Teacher Education

checking the instrument. As pointed out by Anderson and Bourke cited by San Antonio (2006), even number of response categories tend to produce better scale reliability when compared with odd number. In addition, the comments and suggestions of the experts were also sought for the improvement of the questionnaire. Similarly, the items that they recommended to be deleted due to its redundancy were also taken into account. Finally, the suggestions and recommendations of the experts were considered for the finalization of the instrument.

Aside from the survey questionnaire, a semi- structured interview guide was also used in the study. The appropriateness and grammar of the questions were checked by the advisers and by a linguist.

Table 2

Results of the Experts' Validation (Quantitative)

Areas	Mean	Interpretations
Management	3.58	Very Acceptable
Leadership	3.34	Very Acceptable
Curriculum Management	3.40	Very Acceptable
Students Achievement	3.56	Very Acceptable
Professional Development	3.57	Very Acceptable
Partnership Building	3.15	Acceptable
Financial Management	3.46	Very Acceptable
Support System	3.49	Very Acceptable
Tracking of Students	3.40	Very Acceptable
Monitoring and Evaluation	3.42	Very Acceptable



Philippine Normal University

The National Center for Teacher Education

Phase IV. Administration Stage

The pilot testing of instrument was tried- out at the Tanauan City High School. The school is one of the schools in CALABARZON region specifically in the division of Tanauan City which offers the special science program hence; it is assumed that the practices and implementation of the program in this school are similar to that of the schools considered in this study. The school head, science and mathematics teachers assigned to teach in the program were the respondents during the pilot testing. The administration of the questionnaire was done on November 15, 2013 and the researcher personally administered the questionnaire to the respondents. The questionnaires were retrieved immediately and tabulated the results in Microsoft excel. The tabulated result was then submitted to the statistician to compute for the internal consistency using cronbach's alpha.

Reliability of Instrument

According to Pallant (2005) reliability of a scale indicates how free it is from random error. The most commonly used statistic in establishing the internal consistency is the Cronbach's coefficient alpha. This statistic provides an indication of the average correlation among all of the items that make up the scale. Values range from 0 to 1, with higher values indicating greater reliability. While different levels of reliability are required, depending on the nature and purpose of the scale, Nunnally (1978) recommends a minimum level of 0.7. Cronbach alpha values are dependent on the number of items in the scale. When there are a small number of



Philippine Normal University

The National Center for Teacher Education

items in the scale (fewer than ten), Cronbach alpha values can be quite small. In this situation it may be better to calculate and report the mean inter-item correlation for the items. Optimal mean inter-item correlation values range from 0.2 to 0.4 as recommended by Briggs & Cheek, 1986).

A cronbach alpha was used as statistical treatment in analyzing the reliability of the items in the questionnaire. It is a technique used to assess the internal consistency reliability of multiple item scales (Leech, Barrett and Morgan, 2011). It measures how well a set of items (or variables) measures a single unidimensional latent construct. In essence, Cronbach's alpha measures the extent to which a set of variables is inter-correlated. A high inter-correlation suggests that the data are measuring the same underlying construct, and thus are unidimensional. Technically speaking, Cronbach's alpha is not a statistical test - it is a coefficient of reliability (or consistency). It varies from 0 to 1, with 0 indicating no relationship among the items (low internal consistency reliability) and 1 indicating perfect relationship among the items (high internal consistency reliability). The most common use of Cronbach's alpha is to examine whether a number of items in a survey are measuring the same construct. This is the internal consistency reliability of the scale. According to Nunnally & Bernstein (1994), values of Cronbach's alpha of 0.7 or higher are enough to conclude that a scale exhibits adequate internal consistency reliability.



Philippine Normal University
The National Center for Teacher Education

Table 3

Result of Test of Reliability using Cronbach Alpha

Variables	No. of Items	Reliability Coefficient	Interpretation
Management	41	0.875	Very Reliable
Leadership	24	0.922	Very Reliable
Curriculum Management	18	0.912	Very Reliable
Students Achievement	11	0.877	Very Reliable
Professional Development	11	0.914	Very Reliable
Partnership Building	9	0.892	Very Reliable
Financial Management	11	0.950	Very Reliable
Support System	11	0.928	Very Reliable
Tracking of Students	8	0.859	Very Reliable
Monitoring and Evaluation	11	0.918	Very Reliable
Total	155	0.910	Very Reliable

Data Gathering Procedure

Before the administration of the research questionnaire, the researcher sought the permission and approval from the office of the regional director of Department of Education in Region IV CALABARZON. Indicated in the letter the purpose in conducting the study and the benefits it can offer to the public schools offering the special science program. An assurance that the administration of questionnaire will be done without disruption of classes and the responses of the respondents will be treated with utmost confidentiality was emphasized in the letter. When the letter was approved, a letter asking permission from the office of the schools division superintendents was also sent to ask their approval to conduct the study in the target



Philippine Normal University

The National Center for Teacher Education

schools. Upon the approval and indorsement of School Division Superintendent, the letter was personally carried to the office of the school principal of the respective school. Administration of the research questionnaire was made based on the schedule given by the school heads. The administration of questionnaire to the school head and teachers was done during their break time. On the other hand, informal interview was also done after they answered the questionnaire. The respondents were informed ahead of time that their answer during the interview will be recorded for the reference of the researcher to support the finding of the study.

It took a month before the researcher completed the administration and retrieval of questionnaire. The responses were tabulated in excel format while the results of the interview were organized in a matrix form.

Data Analysis

The data collected from the research questionnaire were organized according to variables. Descriptive statistics was used to summarize the data obtained from a self- developed instrument using mathematical procedure. According to Lodico et. al. (2006), the study which used quantitative measure used descriptive statistics to depict the patterns in the data. The frequency distribution was used to describe and record the profile of the respondents. Weighted mean was used to describe the status in the implementation of the program in the eight areas using a four point liker rating scale to guide the researcher in giving appropriate interpretation of the assessment



Philippine Normal University

The National Center for Teacher Education

result. The computed mean score in each indicator was compared against the total quality assurance.

Table 4

Rating Scale used in Assessing the Status of Implementation of Science, Technology, and Engineering (STE) Program

Numerical Rating	Description	Interpretation
4	Excellent	Means that the indicator/ areas are exceptionally implemented (76%- 100% of the time)
3	Very Good	Means that the indicator/ areas are highly implemented (51%- 75% of the time)
2	Good	Means that the indicator/ areas are moderately implemented (26%- 50% of the time)
1	Poor	Means that the indicator/ areas are poorly implemented (1%- 25% of the time)

Phase V. Development of a Management Framework to Enhance the STE Program

In the development of a management framework, the researcher made the analysis based on the quantitative results of the study especially in the variables that were found weak in the management of the program. The variables were streamlined and from nine key areas used to assess the status of the implementation of the program, the researcher came up in the new six areas that constitute the management framework. These are management and leadership, curriculum management, student achievement, professional development, support system, monitoring and evaluation.



Philippine Normal University

The National Center for Teacher Education

The proposed management framework operates within the context of classical management functions; planning, organizing, leading, and controlling. To enhance the management and implementation of the program, the researcher offers strategies which would guide the implementing schools on how they can effectively manage each component in the proposed management framework of STE Program.



Chapter IV

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter presents the findings from the quantitative phase of the study. Data are presented both in tabular and textual form with corresponding analysis and interpretation using the statistical tools. Towards the end, the proposed management framework to enhance the Science, Technology, and Engineering (STE) is presented as the main output of the study.

1. *On the Status of implementation of Science, Technology, and Engineering Program.*

Presented in the succeeding tables are the results in the status of implementation of the Science, Technology, and Engineering Program in five original public secondary schools in CALABARZON region in terms of the management functions namely, planning; organizing; leading; and controlling. The leadership practices in the implementation of the program are also assessed and interpreted based from the responses of the groups of respondents. The curriculum management, student achievement, professional development, partnership development, financial concerns, support system, tracking of students and most importantly, the monitoring and evaluation of the program are taken into account to shed light about the status of the program in the five original secondary implementing schools.

The tables revealed how the respondents regarded the implementation and management of the special science program. Each specific item was rated using the



Philippine Normal University

The National Center for Teacher Education

four point Likert rating scale which guided the respondents in assessing the status of the implementation of the program. The items were drawn from the available materials and literature which defined and described the features of the area being studied. Similarly, the results of the unstructured interview were also presented.

Table 6 shows how the schools exercise planning in putting directions for the implementation of the program. Evidently, the respondents agreed that planning as part in the management of the program is highly implemented ($\bar{x} = 2.81$). The result may be attributed to the fact that the objectives and expectations of the program are explained to them ($\bar{x} = 2.96$) and hence, they are able to clarify things and anchor their plans based on the objectives and expectations. This further suggests that schools implementing the program are aware on the importance of planning and used it as a strategic approach in achieving the objectives of the program. In an informal interview, a principal commented that:

“we see to it that we include in our SIP the future actions and activities to be undertaken to implement the program well. Our school head solicits our comments and suggestions on how we will implement the program better”

Although the general findings in the TQA revealed that the schools implementing the special science program regarded planning as their strength in managing the program however, a gap of 1.19 was recorded. It could be inferred that this gap can be attributed to the weak articulation of plans and contingency measures offered by the school for the proper implementation of the program. This gap further suggests that planning skills of the school heads implementing the program needs



Philippine Normal University

The National Center for Teacher Education

Table 5

Computed Mean of the Planning component of STE Program

#	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter-Pre-Tation
		Mean	Mean	Mean	Mean				
1	Consults with stakeholders including professional association.	3.00	2.90	2.91	2.72	2.88	HI	1.12	S
2	Creates a committee which identifies teachers to be hired for the program.	3.00	3.10	2.73	2.56	2.84	HI	1.16	S
3	Explains the objectives and expectations of the program.	3.20	3.10	2.82	2.70	2.96	HI	1.04	S
4	Formulates policies and activities to help achieve the objectives of the program.	3.20	2.90	2.91	2.60	2.90	HI	1.10	S
5	(a) Sets clear plans for the program. (b) Sets direction for the program.	3.20	2.90	2.55	2.60	2.81	HI	1.19	
6	States clearly the plans for the achievement of the goals of the program	3.00	2.70	2.55	2.42	2.67	HI	1.33	S
7	Develops contingency measures for the implementation of the program.	3.00	2.80	2.55	2.40	2.69	HI	1.31	S
8	Conducts systematic approach in the developing goals and objectives of the program.	3.20	2.80	2.55	2.42	2.74	HI	1.26	S
9	Performs need analysis in making plans for the implementation of the program.	3.20	3.20	2.55	2.42	2.84	HI	1.16	S
10	Identifies methods and techniques in improving the implementation of the program	3.40	2.50	2.82	2.42	2.79	HI	1.21	S
OVERALL		3.44	3.17	2.95	2.79	2.81	HI	1.19	S

Verbal Interpretation: 1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented),
2.51- 3.25 (Highly Implemented), 3.26- 4.00 (Exceptionally Implemented)
Total Quality Assurance: S- Strength W- Weaknesses



Philippine Normal University

The National Center for Teacher Education

to be revisited and enhanced so that they will articulate their plans and offer more concrete directions for the implementation of the program.

When the master teachers and teachers were asked on what else they can suggest for the proper implementation of the program, among the issues raised by them are:

“ I suggest that we will be involved during planning process instead of just asking us on what else the school can offer. I think if we will be involved in planning, we will be able to crystallize our ideas and come up in good strategies that will help achieve the goals of the program”

The research relates the findings presented in the table to Aquino (2000) which explains that planning facilitate and directs all activities of the subsystems toward achieving the set mission and vision.

The gap presented in the study supported the statements of Bateman and Snell (2007) which opined that the difference between successful and unsuccessful manager depends on their planning procedure. As added by Robbins and Coulter (2012) specify that the action program would be considered in order to achieve the goals.

Schermerhorn (2005) emphasized that planning helps to decide exactly what one wants to accomplished and how to best go about it. It helps the organization to become better and better at what they are doing and to stay action oriented.

The findings also validated the findings of Chua (2012) in her study that planning can deliberately affect the system of education in achieving relevant



Philippine Normal University

The National Center for Teacher Education

objectives. As such, review in the effectiveness of the planning practices of the school heads in managing the program is equally important.

Given these situations, school managers must be dynamic in developing plans which would improve the implementation of the program. By planning, he or she must recognize the importance of collaborative work from the teachers and others who are involved in the implementation of the program.

The data presented in the table 7 generalizes the responses of respondents on the management practices of in the implementation of special science program in terms of organizing. All the items in the table were assessed by the respondents using the likert rating scale ranging from poorly implemented to exceptionally implemented. The corresponding interpretation in the computed weighted mean is also indicated to show the degree on how the function of management is practiced in the implementation of the program. On the other hand, TQA is also considered to determine the strength and weaknesses in the program.

It could be gleaned in the table the overall computed weighted mean score ($\bar{x} = 2.93$) with verbal interpretation of “highly implemented”. It was noted that even though all the items are deemed highly implemented, the gap of 1.09 was recorded against the TQA. The findings suggested that although the results found that organizing is one of the strengths in managing the program, this management function needs to enhance. Armstrong (2005) asserts that the manager has the role of organizing resources to get something done. The school through the able leadership of the school head must be able to recognize the potentials of the teachers so that



Philippine Normal University The National Center for Teacher Education

Table 6

Computed Mean of the Organizing Component of STE Program

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter Pre-Tation
		Mean	Mean	Mean	Mean				
1	Determines the activities that could achieve the objectives of the program.	3.40	2.90	4.00	2.74	3.26	HI	0.74	S
2	Has a clear structure and organization which defines the functions and responsibilities of school heads, teachers, parents, and students.	3.20	3.10	2.81	2.72	2.96	HI	1.04	S
3	Have functional structures that monitor the implementation of the program.	3.00	2.90	2.72	2.58	2.80	HI	1.2	S
4	Allocates materials, resources, and supplies needed to support the implementation of the program.	3.40	2.90	2.82	2.53	2.91	HI	1.09	S
5	Prioritizes activities that could strengthen the implementation of the program.	3.00	3.00	3.00	2.72	2.93	HI	1.07	S
6	Sets clear rules and guidelines in adapting instructional materials.	3.20	3.00	3.00	2.51	2.93	HI	1.07	S
7	Coordinates activities for the implementation of the program.	3.20	2.80	2.91	2.63	2.93	HI	1.07	S
8	Employs creative and systematic approach in solving problems in the implementation of the program.	3.00	2.70	2.82	2.60	2.89	HI	1.11	S
9	Uses the results of the actual implementation in organizing much improved program.	3.20	2.90	2.91	2.47	2.78	HI	1.22	S
10	Establishes an organize structure that clarifies working relationship among internal stakeholders.	2.80	3.00	2.91	2.47	2.87	HI	1.13	S
OVERALL		3.14	2.92	2.99	2.60	2.93	HI	1.09	S

Verbal Interpretation:

1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented),
2.51- 3.25 (Highly Implemented). 3.26- 4.00 (Exceptionally Implemented)

the plans set for the achievement of the objectives of the program will turn into actions.

In an interview with the school heads, it was evident that due to the voluminous work and responsibility assigned to them they delegate the tasks among the teachers who they believe responsible enough in helping them to implement and

“aside from being department head, I am also the program



Philippine Normal University

The National Center for Teacher Education

meet the objectives of the program. Basically, the department heads assisted the school head as they are formally designated as the program coordinator. As program coordinator they commented that:

“to ensure that we have the same understanding about the program, I guess we have to receive an orientation as to the policies of the program. I suggest our school principal who is attending the seminars will impart to us the things that she learned from it especially, in management aspect of the program”

The findings of the study harmonizes to the work of Robbins and Coulter (2012) which explains that in order to achieve the goals, the managers have to ensure that they have the resources required and that the human element of those resources is properly organized in the sense of deciding what needs to be done, grouping activities together, establishing lines of communication and control and defining responsibilities and accountabilities.

The researcher found the importance of organizational structure in the implementation of the program hence; it affirmed the statement of Erven (2006) that it is important in the organization to establish the internal organizational structure to ensure coordination and control of tasks and the flow of participants.

In the same vein, it validated the findings of Falogme (2011) which surfaced during interview that because of too many things the school managers prioritized in planning hence, they become weak in assisting people. This condition can be simplify if the school managers would learn how to delegate things in right persons



Philippine Normal University

The National Center for Teacher Education

in the organization who would also have the passion and vision in achieving the objectives of the program.

The management practices in the implementation of the special science program in terms of leading are shown in the next table. The computed over all mean alongside of the verbal interpretation are also presented to reveal the degree of agreement or disagreement of the groups of respondents in the items used to assessed the implementation of the program. There are eleven items presented in the table and each item is rated according to the rating scale employed in the study particularly, in measuring the status of implementation of the program.

As shown in table 8 the combined computed weighted mean scores from the school heads ($\bar{x} = 3.25$), department heads ($\bar{x} = 3.02$), master teachers ($\bar{x} = 2.93$) and teachers ($\bar{x} = 2.57$) achieved 2.94 in the management practices in the implementation of program in terms of leading. The groups of respondents agreed that this practice in the implementation of the program is “highly implemented”. However a gap of 1.06 was recorded thus, this indicates that the intended total quality assurance is not reached.

Therefore, leading as one of the critical phase in the management of the educational program like the special science program must be given attention and enhancement. This further exerts that management headed by the principal and assisted by department heads must create an environment which promotes and arouse the interest and enthusiasm of the teachers toward the achievement of the objectives of the program.



Philippine Normal University

The National Center for Teacher Education

Table 7

Computed Mean of the Leading Component of STE Program

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter Pre-tation
		Mean	Mean	Mean	Mean				
1	Communicates the actualities in the implementation of the program with the stakeholders.	3.20	3.10	2.73	2.49	2.88	HI	1.12	S
2	Creates working and learning environment which nurtures the teachers and learners.	3.20	2.80	2.82	2.51	2.83	HI	1.17	S
3	Encourages teachers, parents, and students to give feedback in the implementation of the program.	2.60	2.40	3.09	2.60	2.88	HI	1.12	S
4	Establishes and implements policies and procedures for the learning and teaching environment.	3.20	3.00	2.91	2.60	2.93	HI	1.07	S
5	Helps teachers in their instruction through coaching and mentoring activities.	3.40	3.20	3.18	2.67	2.88	HI	1.12	
6	Provides organizational direction to sustain the program.	3.00	3.10	3.00	2.51	2.90	HI	1.10	S
7	Encourages teachers to be creative in implementing activities in support to the implementation of the program.	3.60	3.20	2.91	2.70	3.10	HI	0.90	S
8	Empowers and lead teachers un accomplishing activities according to the expectation of the program.	3.20	2.90	3.00	2.53	2.91	HI	1.19	S
9	Demonstrates leadership skills in the achievement of the program's goals and objectives.	3.40	3.20	3.09	2.60	3.07	HI	0.93	S
10	Promotes shared vision with teachers to improve their classroom practices.	3.60	3.20	2.91	2.53	3.06	HI	0.94	S
11	Provides opportunities and incentives to teachers to improve their classroom practices.	3.40	3.10	2.64	2.56	2.93	HI	1.07	S
OVERALL		3.25	3.02	2.93	2.57	2.94	HI	1.06	S

Verbal Interpretation:

1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented), 2.51- 3.25 (Highly Implemented). 3.26- 4.00 (Exceptionally Implemented)

As explained by Daft (2000) leading is the use of influence to motivate employees to achieve organizational goals. It means creating a shared culture and values, communicating goals to the employees throughout the organization, and infusing employees with the desire to perform at a high level. It involves motivating



Philippine Normal University

The National Center for Teacher Education

entire departments and divisions as well as those individuals working immediately with the manager.

In analysis of the results, it verifies that school heads are the ones who set the tones for the organization. They are the ones who take a lead in directing teaches in accomplishing the goals set for the proper implementation of the program.

In connection, the fire of enthusiasm and passion to successfully implement the program, the school heads must rekindle and instill the same passion to the teachers.

The management practices in the implementation of Science, Technology, and Engineering Program in the five original secondary schools in CALABARZON region in terms of controlling are presented in table 9.

As shown in the table the overall mean achieved a score of 3.04 with verbal interpretation of “highly implemented” as reveled by the respondents. However, as observed in the same table a gap of 0.96 was recorded which tells that the standard for the total quality assurance is not reached.

The over-all findings conveyed that, controlling as seen as a process in measuring the effectiveness in the implementation of the program hence, the schools must exert more effort and energy in making sure that objectives set for the program are being met. Providing an open and accessible communication with the teachers involved must be ensured and appropriate actions should be taken into consideration to meet the desired results. The use of appropriate assessment tools to gather and



Philippine Normal University

The National Center for Teacher Education

Table 8**Computed Mean of the Controlling Component of STE Program**

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter-Pre-tation
		Mean	Mean	Mean	Mean				
1	Monitors and assesses the performance of teachers and students.	3.40	3.30	2.82	2.86	3.10	HI	0.90	S
2	Offers corrective actions and measures to reduce flaws in the implementation of the program.	3.40	3.10	2.82	2.70	3.01	HI	0.99	S
3	Sets standards for the program.	3.20	3.20	3.00	2.72	3.03	HI	0.97	S
4	Conducts direct observation to teachers and students.	3.00	3.20	3.00	2.77	2.99	HI	1.01	S
5	Requires teachers to present an analysis about the progress of students enrolled in the program.	3.20	3.20	2.73	2.70	2.96	HI	1.04	S
6	Ensures proper use of and maximization of instructional materials and equipment that support students' learning	3.40	3.00	2.82	2.81	3.01	HI	0.99	S
7	Conducts performance review of teachers and students.	3.40	3.20	3.00	2.74	3.09	HI	0.91	S
8	Explains the responsibilities of teachers, parents, and students in the program.	3.60	3.30	3.00	2.67	3.14	HI	0.86	S
9	Gives priority attention to situations which need immediate attention.	3.40	3.30	3.09	2.65	3.11	HI	0.89	S
10	Formulates necessary actions for the improvement of teachers and students' performances.	3.20	2.90	3.00	2.65	2.94	HI	1.06	S
OVERALL		3.32	3.17	2.93	2.73	3.04	HI	0.96	S

Verbal Interpretation:

1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented), 2.51- 3.25 (Highly Implemented). 3.26- 4.00 (Exceptionally Implemented)

interpret data may be used to determine the performance of the teachers and students. The result of the assessment may be used as feedbacks and essential inputs in constructing/ developing plans that would meet the objectives and for the effective management of the program.

According to Schermerhorn and Chappell (2005), controlling sees to it that right things happened in the right way, and at the right time. It helps ensure that the



Philippine Normal University

The National Center for Teacher Education

performance contributions of individuals and groups are consistent with strategic and operational plans. It helps ensure that performance accomplishments throughout an organization are well integrated in means- end fashion. And it helps ensure that people comply with organizational policies and procedures.

To achieve the effective implementation of the program, the researcher banked on the statement of Daft (2000) which explains that managers must move toward its goals. Monitoring of the activities and determining whether the organization is on target toward its goals, and making corrections as necessary.

The findings of the study further stress that school managers focus more on controlling and ensuring that the program is properly implemented. However, similar to the study of Chua (2012) this management function requires enhancement.

Meanwhile, table 10 presented the summary of the computed weighted mean scores of the four management functions used in the study. Verbal interpretations and TQA alongside the scores are also provided.

Results in table illuminates that the four management functions; planning ($\bar{x} = 2.81$), organizing ($\bar{x} = 2.93$), leading ($\bar{x} = 2.94$), and controlling ($\bar{x} = 3.04$) obtained the overall mean score of 2.93 with 1.09 gaps from the TQA. Although the findings revealed that these functions are “highly implemented” and are considered ‘strength’ in the implementation of the program nevertheless, the discrepancy of the result from the TQA rating revealed that implementation of special science program need more enhancement so that sound management and proper implementation of the program will be achieved.



Philippine Normal University

The National Center for Teacher Education

Table 9

Summary of Computed Weighted Mean of the Management Functions in the Implementation of Science, Technology, and Engineering Program In CALABARZON Region

Management functions	Overall Mean	Verbal Interpretation	Gaps	Interpretation
Planning	2.81	Highly Implemented	1.19	Strength
Organizing	2.93	Highly Implemented	1.07	Strength
Leading	2.94	Highly Implemented	1.06	Strength
Controlling	3.04	Highly Implemented	0.96	Strength
Total	2.93	Highly Implemented	1.07	Strength

Further analysis in the implementation of the program revealed that controlling is the most regarded management functions. This showed that all the activities pertaining to the implementation of the program are strictly observed and make sure that these conforms to the objectives of the program. It could be inferred that the schools are observing measures which accord in the implementation of the program. In contrast, planning was regarded as least in the management functions although it remains highly implemented and is one of the strengths in the management of the program.

Nevertheless, the conclusion of drawn by the researcher is supports that of Ghavifekret. et. al that the management functions are key elements in organizational success. In order to attain the desired goals and objectives, these functions must be developed in effective and efficient ways to best suit to the organization's activities.



Philippine Normal University

The National Center for Teacher Education

Table 11 reveals the practices in the leadership component in the implementation of special science program in the original secondary schools in CALABARZON region. The mean across each group of respondents is computed to generate information which would help to interpret and analyze the implementation of the program.

The data presented in the table reflects that the schools offering the special science program highly implements ($\bar{x} = 2.89$) leadership as perceived by the four groups of respondents. This implies that the school heads effectively model and influence the teachers so that everyone is working towards the attainment of goals for the successful implementation of the program. This can be related to the practices like setting high expectations from teachers and students to exert more effort for better performance by ensuring that instructional supervision in school level is observed. The school heads build confidence on the capability of teachers and students by making them responsible and accountable for their performance in the program.

Although the components was perceived as highly implemented and is considered as strength of the program yet, when applied to the principle of total quality assurance a gap of 1.11 was observed. This connotes that the leadership practices in the schools implementing the program need enhancement.



Philippine Normal University

The National Center for Teacher Education

Table 10

Computed Mean on the Leadership component of STE Program

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter Pre- tation
		Mean	Mean	Mean	Mean				
1	Articulates the mission, vision, goals and expectations of the program.	3.40	3.00	2.82	2.70	2.98	HI	1.02	S
2	Consults with the teachers to get feedback in the implementation of the program.	3.20	2.90	2.82	2.70	2.91	HI	1.10	S
3	Monitors the teaching and learning process.	3.40	3.20	3.00	2.77	3.09	HI	0.91	S
4	Provides resources for the implementation of the program.	3.40	3.10	2.73	2.49	2.98	HI	1.02	S
5	Facilitates collaborative efforts among teachers.	3.40	3.10	2.73	2.53	2.94	HI	1.06	S
6	Encourages the conduct of instructional research to make decisions.	3.20	2.90	2.91	2.58	2.90	HI	1.10	S
7	Extends direct assistance to teachers in their day to day activities.	3.20	3.20	2.73	2.51	2.91	HI	1.09	S
8	Develops and maintains collaborative efforts for better performance among groups and staff.	3.20	3.00	3.00	2.53	2.93	HI	1.07	S
9	Leads in the managing curriculum and instruction.	3.00	2.90	3.00	2.56	2.87	HI	1.13	S
10	Promotes positive school culture.	3.20	2.90	2.73	2.70	2.88	HI	1.12	S
11	Involves teachers, students, and parents in making decisions for the program.	3.20	2.80	2.73	2.53	2.82	HI	1.18	S
12	Solicits feedback from stakeholders for the improvement of the program.	3.00	2.80	2.64	2.42	2.72	HI	1.28	S
13	Assists stakeholders in addressing the needs of school as a complex social organization.	3.00	2.60	2.46	2.40	2.62	HI	1.38	S
14	Initiates the collective efforts of staff in setting vision, fostering commitment, identification, and promoting organizational learning	3.20	2.70	2.82	2.44	2.79	HI	1.21	S
15	Trains teachers to perform instructional leadership toward improved result.	3.20	3.00	3.09	2.40	2.92	HI	1.08	S
16	Explains clearly the objectives, targets, and performance measures for the improvement of the program.	2.80	2.80	3.00	2.47	2.77	HI	1.23	S
17	Designates other teachers to assume leadership tasks of the program.	3.40	3.00	2.91	2.44	2.94	HI	1.06	S
18	Targets challenging and measurable goals of the program.	3.00	3.00	3.00	2.60	2.90	HI	1.10	S
19	Sets high expectations from teachers and students for them to exert more efforts for better performance.	3.40	3.30	3.09	2.67	3.12	HI	0.88	S
20	Build the confidence of teachers and students to achieve the goals of the program in the highest level.	3.40	3.10	3.00	2.63	3.03	HI	0.97	S
21	Maintains clear and viable vision for the program	3.20	3.10	3.00	2.56	2.97	HI	1.03	S
22	Manages group processes and group dynamics in envisioning for the implementation of the program.	3.40	2.90	2.82	2.44	2.89	HI	1.11	S
23	Communicates the vision and involve internal stakeholders in the management of the program.	3.00	2.80	2.91	2.37	2.77	HI	1.23	S
24	Provides avenues for the teachers, students, and parents for them to take active part in making decisions, solving problems, and in shaping the goals that will actualize the vision of the program.	2.80	2.80	2.73	2.49	2.71	HI	1.29	S
OVERALL		3.19	2.96	2.87	2.54	2.89	HI	1.11	S

Verbal Interpretation:

1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented), 2.51- 3.25 (Highly Implemented). 3.26- 4.00 (Exceptionally Implemented)



Philippine Normal University

The National Center for Teacher Education

The observed results were verified by the respondents during the interview:

“ I admired our madam principal for her leadership in implementing the program considering that our school is considered exceptional big and her age, she still able to provide us instructional guidance on how we can successfully implement the program”.

“Our principal expects a lot from us... she allows us to do activities which could help to enhance the learning of our students, she welcomes our ideas and never makes us feel intimidated by her suggestions and corrections.

“Whenever there are seminars especially for the school heads of the implementing schools, our principal accompanied me and helps me understand the policies in the implementation of the program”.

“she ask us how we are doing in the program.. but it’s not as simple as that... she means to show her the evidence of performance of our students and she ask us what else we can do to help the students and improve the program.

The findings of the study concedes with the statement of Welch in Slater (2003) who proposed that one of the secret in leadership is to nurture employees by giving them responsibilities and be accountable for the success of the organization. In order to achieve this, barriers that deter the involvement of the members of the organization must be removed.

The same view was made by Sanchez (1996) which verifies that effective leaders must act as resource person who can model and help the groups in processing and broadening their perspective so that they will be able to regard the problem in different views.



Philippine Normal University

The National Center for Teacher Education

Spanbaeur (1992) made his concluding remarks that empowering teachers and giving them maximum opportunity by involving them in decision-making will help to improve the learning of their students

The importance of leadership has been identified as crucial to the change process and to improving student learning, effective schools, school improvement, and school change and implementation (Sheppard, 2009). It is supported by Fullan (2001) in saying that the importance of leadership in generating and sustaining school development and change.

Sanchez (1996) verifies that in order to become an effective leader, one must act as resource person who can model and help the group in processing and broadening their perspective so that they will be able to regard the problem in different views. He added that a person with good leadership trait sincerely believes in the creativeness of human intelligence and focus in cultivating leadership in others by providing them an avenue which will showcase their full potentials. Most importantly, a good leader stimulates the individual members to think reflectively and then guides them in weighing ideas and appraising based on the objective criteria.

Bennis (2003) emphasizes that modern leaders must not rely on their personal skills or charisma to produce change. He identifies four critical characteristics of effective leadership. First, leaders must be able to engage others through the creation of a shared vision. Second, leaders must have a clear voice that



Philippine Normal University

The National Center for Teacher Education

is distinctive to constituents. This voice should be characterized by a sense of purpose, a sense of self, and self-confidence. Third, leaders must operate from a strong moral code and a belief in a higher good that fuels their efforts. Finally, leaders must have the ability to adapt to relentless pressure to change.

Supported by the results of studies, the researcher came into realization that indeed the leadership skills and styles of the school heads matter in the operation of the school and moreso, in bringing tremendous energy to the teachers to achieve the implementation of the program in CALABARZON Region.

The results of data in table 12 present the perceptions of the respondents in relation to the curriculum management in view of the implementation of the science, technology, and engineering program.

The data provided in the table revealed that respondents perceived curriculum management in the implementation of the Science, Technology, and Engineering Program across the five original public secondary schools in CALABARZON region is “highly implemented” as the combined computed weighted mean achieved a score of 3.12. It was also regarded by the respondents as one of the “strengths” in the implementation of the program although a gap of 0.88 was observed against the TQA rating.

The findings suggest that curriculum management doesn’t achieve the standard for quality assurance therefore, revisiting and strengthening further the curriculum management skills of the implementers of the program should be given



Philippine Normal University

The National Center for Teacher Education

attention. Since the program offers enriched subjects compared to the regular students hence, acquisition of necessary skills in managing the curriculum is relatively imperative.

These skills can be achieved by studying and understanding the objectives and standards of the present curriculum and the underlying theories which would lead to the realization of the desired learning outcomes on the part of the students. In addition, in order to gain equal understanding and communalities in the language used about the curriculum management the standards of the curriculum may be communicated to all concern.

As further revealed in the answer of the respondents during an interview, most of them have proper training in the implementation of the K to 12 Basic Education Curriculum. Although some teachers commented that:

“ I have attended the regional mass training last summer but most of the sessions are about demonstration teaching which I personally believed is what we have been doing in normal classroom setting. There is nothing new”

“I actually don’t know what curriculum to follow, last year we are using the UbD and now the k to 12 yet little information is imparted to us. The seminar in the k to 12 doesn’t provide me enough understanding about the new curriculum. Maybe after a year I will be able to understand fully the curriculum”.

“ I hope there is follow up in school with regards to the Implementation of the new curriculum especially in the special science program. Or at least in the district level where we are being supported by follow up trainings so that common understanding will be manifested among us”.



Philippine Normal University

The National Center for Teacher Education

Table 11

Computed Mean of the Curriculum Management Component of STE Program

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter-Pre-tation
		Mean	Mean	Mean	Mean				
1	The school heads and teachers are well informed about the implementation of curriculum of the program.	3.80	3.50	3.09	2.81	3.30	HI	0.70	S
2	The teachers have enough training on the proper implementation of the curriculum.	3.60	3.50	3.09	2.58	3.19	HI	0.81	S
3	The students are provided with activities that will harness their skills expected of them in the program.	3.60	3.20	3.09	2.72	3.30	HI	0.7	S
4	The teachers utilize innovative strategies and methodologies in teaching the students.	3.60	3.20	3.18	2.74	3.18	HI	0.82	S
5	The teachers show mastery and confidence in teaching the subject more importantly the elective subjects.	3.40	3.20	3.27	2.88	3.30	HI	0.70	S
6	The teachers effectively communicated the curriculum standard to the learners.	3.60	3.20	3.27	2.88	3.24	HI	0.76	S
7	There are available materials, resources, and technology which can be used to implement the curriculum properly.	3.00	2.90	2.55	2.49	2.74	HI	1.26	S
8	The relevance and applicability of the curriculum is assessed based on the students' performance.	3.20	3.10	3.00	2.77	3.02	HI	0.98	S
9	The curriculum promotes intended learning and skills to be developed among students based on the objectives of the program.	3.40	3.10	3.09	2.81	3.10	HI	0.90	S
10	The learning of the students under the program relates with the global, national, local, school and needs of the students.	3.20	3.00	2.90	2.84	2.99	HI	1.01	S
11	The teachers utilize lesson and activities that promote the development of values and proper attitude among students.	3.60	3.40	3.27	2.93	3.30	HI	0.70	S
12	The students demonstrated mathematical and scientific skills in addressing problems confronting them.	3.40	2.90	3.00	2.91	3.05	HI	0.95	S
13	The learning taking place in students is related to their vicarious experiences.	3.20	2.90	2.91	2.95	2.99	HI	1.01	S
14	The teachers are able to explain the subject content with confidence.	3.60	3.40	3.27	3.02	3.32	HI	0.68	S
15	The teachers present the lesson accordingly with the approaches embedded in the curriculum	3.40	3.20	3.00	2.93	3.13	HI	0.87	S
16	The research skills of students are emphasized in their activities.	3.20	3.10	3.09	2.98	3.09	HI	0.91	S
17	Research outputs are utilized and applied in the teaching- learning process.	3.20	2.80	2.91	2.86	2.94	HI	1.06	S
18	Measurement of learning is based on outcomes- result of government examination achievement in national and international competitions.	3.20	3.10	2.73	2.81	2.96	HI	1.04	S
OVERALL		3.40	3.15	3.04	2.83	3.12	HI	0.88	S

Verbal Interpretation:

**1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented),
2.51- 3.25 (Highly Implemented). 3.26- 4.00 (Exceptionally Implemented)**



Philippine Normal University

The National Center for Teacher Education

Curriculum leaders according to Glatthorn et. al (2012) should review and monitor curriculum policies to make sure the policies align with curricular goals and support student learning.

Ogena et. al (2010) recommended to revisit the implementation of curriculum in science schools that performed far behind the PSHS. Periodic evaluation of the effectiveness of the special science curriculum being followed in the other science high schools may be done in order to determine the improvement that would have to be done. They further recommend that the science high schools may look into the curriculum and practices of PSHS and the schools teaching advanced mathematics in other countries or them to improve their performance.

Similarly, the findings of the study affirmed the worked of Omalin (2012) as she states that the important tasks of the school head is making sure that the instructional objectives are aligned with curricular goals. Thus, the school heads must be competent in demonstrating the ability to identify instructional objectives and use valid and reliable performance indicators and evaluate procedure to measure performance outcomes, in demonstrating the ability to enhance teaching and learning through curriculum assessment and strategic planning for all learner.

However, both studies revealed that curriculum management and development need further enhancement and needed appropriate actions in order to attain the total quality assurance for effective and efficient implementation of the program.



Philippine Normal University

The National Center for Teacher Education

Presented in table 13 the results of assessment based from the perceptions of the respondents on the students' achievement in Science, Technology, and Engineering Program in CALABARZON region. The respondents assessed the indicators that influenced the achievement of students in the implementation of the program. The results of the survey were computed to determine and capture the status in the implementation of the program. This was done by comparing the computed overall means to the TQA rating.

The data generalizes the perception of school heads, head teachers, master teachers and teachers on the status of the implementation of the special science program. The respondents have the same perceptions in the students' achievement as they agreed that all the indicators in this area being studied were highly implemented.

It is noteworthy that the schools recognize the performance of students especially of those who displayed outstanding performance in the program. This manifests that the schools provided moral support to students and let the students know that their effort in bringing recognition to the program is acknowledge by the school. Seemingly, in order to raise the quality of academic performance of the students the teachers collaborate with each other to ensure that the students will be able to acquire the necessary skills expected from them while in the program.



Philippine Normal University

The National Center for Teacher Education

Table 12

Computed Mean on the Students' Achievement Component of STE Program

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter Pre-tation
		Mean	Mean	Mean	Mean				
1	Teachers collaborate with each other in delivering their performance to ensure the success of students.	3.40	3.40	3.27	3.00	3.27	HI	0.73	S
2	The learning environment is conducive to learning	3.40	3.20	3.18	2.95	3.18	HI	0.82	S
3	The students acquire necessary skills embedded in the program.	3.20	3.10	3.18	2.90	3.27	HI	0.73	S
4	Teachers implement activities that reinforce the learning of students.	3.60	3.30	2.64	2.98	3.13	HI	0.87	S
5	Teachers performed outcome based of assessment that measures the achievement of students.	3.20	2.90	2.82	2.98	3.27	HI	0.73	S
6	Teachers use innovative teaching strategies to support the learning of students.	3.00	2.90	2.82	2.93	2.91	HI	1.09	S
7	The school conducts action research to improve the performance of students in the program.	3.00	2.90	2.91	2.79	2.90	HI	1.10	S
8	The results of assessment are used to formulate plans for the improvement of students' achievement.	2.80	3.10	2.91	2.81	2.91	HI	1.09	S
9	The students are exposed to different learning environment which will facilitate their learning.	3.20	2.90	2.91	2.86	2.97	HI	1.03	S
10	Technology is integrated in teaching to facilitate the learning of students.	3.20	3.00	3.00	3.05	3.06	HI	0.94	S
11	The school gives recognition to the students who manifest outstanding performance in the program.	3.40	3.60	3.00	3.11	3.28	HI	0.72	S
OVERALL		3.22	3.12	2.97	2.94	3.10	HI	0.90	S

Verbal Interpretation:

1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented), 2.51- 3.25 (Highly Implemented). 3.26- 4.00 (Exceptionally Implemented)

Assessment on the other hand, was viewed by the respondents as essential in determining the level of proficiency of the students and in knowing where the students are relative to the objectives of the program. It was not surprising though, that the students were able to perform and learn more considering that they are provided of a healthy and conducive learning environment where only about thirty



Philippine Normal University

The National Center for Teacher Education

five students are allowed in one section and supported by resources allowed in the utilization of fund for the implementation of the program.

To further support the students to improve their performance, the respondents in unison agreed that teachers implement activities that reinforce the learning of students by providing them of more enriched activities where technology is also integrated to facilitate the learning of students. Exposing the students in different learning environments by using different innovative teaching strategies were also highly implemented in the schools implementing the program. Moreover, the results of the assessment are used to formulate plans for the improvement of the students' achievement. It was also noted that the schools highly implemented the conduct of action research to improve the performance of the students in the program.

The general findings of the study revealed that all these practices were the strengths of the schools in CALABARZON region implementing the Science, Technology, and Engineering program. Although the data revealed that there was a gap of 0.90 in TQA rating which tells that these practices still need room for improvement. Hence, it can be inferred that the gap pose challenge to the schools implementing the program. The results also demanded further considerations in raising the achievement of the students and require all implementers of the program to strive more so that that quality and the objectives set will be achieved by the students.

Table 14 depicted the assessment of the respondents on different practices in professional development in the schools five original secondary schools in



Philippine Normal University

The National Center for Teacher Education

Table 13

Computed Mean of the Professional Development Component of STE Program

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter-Pre-tation
		Mean	Mean	Mean	Mean				
1	Teachers involved in the implementation of the program attend seminars, workshops, and trainings which will enhance their competence in teaching the students.	3.20	3.30	3.27	2.72	3.12	HI	0.88	S
2	The school promotes the school based professional development plan for the teachers.	3.00	3.20	3.00	2.86	3.02	HI	0.98	S
3	The Bureau of Secondary Education provides trainings, seminars, and workshop resulting from the need assessment of school heads and teachers.	3.20	3.30	3.00	2.72	3.06	HI	0.94	S
4	The teachers are equipped with new trend and innovative teaching practices obtained from seminar, trainings, and workshops.	3.00	3.10	2.82	2.65	2.89	HI	1.11	S
5	The teachers involved in the program availed of the scholarship program offered to them.	3.20	2.90	2.27	2.58	2.74	HI	1.26	S
6	The teachers articulate their plans for their professional development while in the program.	3.20	3.10	2.82	2.77	2.97	HI	1.03	S
7	The teachers are sent to research seminars which capacitate their research skills particularly in offering solutions to problems confronting the implementation of the program.	3.00	3.20	2.82	2.63	2.91	HI	1.09	S
8	The teachers involved in the implementation of the program acquire academic competence by attending graduate program related to their area of specialization.	3.40	3.20	2.73	2.77	3.03	HI	0.97	S
9	Implements professional development for teachers which develop their instructional competence.	3.00	3.20	2.82	2.60	2.91	HI	1.09	S
10	The professional development offered to the teachers is congruent to the mission, vision, goals, and objectives of the program.	3.00	3.30	2.82	2.63	2.93	HI	1.07	S
11	The professional development plan integrates values as main ingredient in the further development of teachers.	3.20	3.20	2.73	2.67	2.95	HI	1.05	S
OVERALL		3.13	3.18	2.83	2.69	2.96	HI	1.04	S

Verbal Interpretation:

1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented), 2.51- 3.25 (Highly Implemented). 3.26- 4.00 (Exceptionally Implemented)



Philippine Normal University

The National Center for Teacher Education

CALABARZON region implementing the program. The responses were tabulated and the mean was computed to determine the status of its implementation.

Data on table 14 exhibits that professional development is highly implemented as perceived by the school heads, head teachers, master teachers, and teachers. The high level of implementation based on the assessment of the respondents achieved an overall computed mean 2.96. All respondents agreed that all the indicators were highly implemented and are considered strengths in the implementation of the program although a gap of 1.04 against the total quality assurance rating was recorded. This impels that the standard for the professional development was not met thus, it can be inferred that professional development as part in the implementation of the program need further enhancement.

According to the respondents, to support the teachers who are involved in the implementation of the program they were sent in seminars, workshops, and trainings which will capacitate and enhance their competence. Some of the teachers involved in the program are attending graduate studies or program related to their area of specialization. The school on the other hand, provides school based professional development plan so that teachers will articulate their future plans. Values are also integrated in the professional development plan as main ingredient in the further development of teaches.

The respondents also revealed that the professional development offered to them aside from it is based on need analysis; is also congruent to the mission, vision, goals, and objectives of the program. They also revealed that schools sent teachers in



Philippine Normal University

The National Center for Teacher Education

research seminars which capacitate the research skills and guide them in addressing some problems in the implementation of the program. Because of the opportunities given to the teachers, they are equipped with new trends and innovative teaching practices that they applied in facilitating and processing the learning of their students.

Hord and Tobia (2012) presented the characteristics which would generate powerful professional learning. According to them, this includes creating an atmosphere and context for change, develops and communicates a shared vision for change, plan and provide resources, invest in professional development, check progress, and give continuous assistance.

The following statements typify their responses:

“whenever there are trainings especially in the implementation of the new curriculum, I send my teachers to the seminar. I see to it that they are given equal chances and opportunities to acquire necessary knowledge and understanding in delivering the new curriculum. This is one of the help that I can give to the teachers so that they can implement the curriculum better. On the first place, they are the ones who will teach the students. My part is to monitor and give instructional support to them”.

“As department head in mathematics, I prepare a training design and presented it to our principal. Basically, the training is based on the result of the arising needs of the teachers for example in teaching strategies and assessment matters. Once the training proposal has been approved and fund is allocated, we provide the training or sometimes workshop to the teachers in my department”.

“ I am grateful because I was able to attend seminars in Biotechnology and Environmental Science organized by the Bureau of Secondary Education. It was only last year that seminars like these were given to us. We gain new knowledge and understanding especially in developing teaching guide. It helps a lot”.



Philippine Normal University

The National Center for Teacher Education

However, when the teachers were asked about their suggestions for their professional development, their responses are follows:

"I suggest that there should be a consistent and continuous professional development program for teaches in school where we, teachers who are involved in the implementation of the program will be able to upgrade our instructional competence".

"I hope, the regional supervisor and division supervisors will use the power of social media especially the facebook in creating a functional group that could share best practices and exchange resource materials that would help other teachers to upgrade our teaching competence."

The BSE confirmed that:

"Many schools conducted school-based trainings which merely echoed what were discussed at the national/regional trainings, thus leaving many teachers with inadequate knowledge about key concepts and approaches. Likewise, seldom were training conducted beyond the curriculum to include aspects like class management and assessment of learning outcomes".

It can be concluded therefore, that professional development of teachers involved in the implementation of the program is one of important vehicles in achieving the objectives of the program thus, schools implementing the program are encourage to design professional development plan for the teachers. The professional development plan which will be developed will support the teachers to improve their instructional competence.

Hargreaves and Fullan (2012) emphasized that professional learning communities need architecture or design they are going to be productive. They have



Philippine Normal University

The National Center for Teacher Education

to be organized and arranged. This statement was supported by Leithwood (2012) that in any circumstances, a principal needs very solid team building skills- skills that build teachers capacity to work together collaboratively.

Zagarac (2012) added that in order for the teachers in a purposeful way, their commitment to their work, teachers' feeling of cohesion among themselves including positive school climate, really depend on having clarity about the focus of their work and their role in it.

Tobia and Hord (2012) argue that the movement called professional learning communities must become the norm in every school and that this can only happen if the leadership of the school supports it and creates working conditions in which professional learning communities can flourish.

McEwan (2003) assets that highly effective principals know how to help staff, students, and parents explore problems, confronting difficult issues, and consider possible solution. They use communication strategy as needed.

Table 15 conveys the assessment of the respondents in the five original secondary schools implementing the Science, Technology, and Engineering Program in CALABARZON region in terms of partnership building. The appropriate statistical treatment was used to generate the overall mean which illuminates how partnership building is implemented in the said schools.

The data in table signifies that the school heads, department heads, master teachers, and teachers disclosed that partnership building in their schools was moderately implemented. Although two of the items were rated as highly implemented however, the combined responses revealed that partnership building is the weakness in the implementation of the program in the five schools in



Philippine Normal University

The National Center for Teacher Education

CALABARZON region. It can be inferred, that the schools do not maximize the opportunities in soliciting the active participation of other stakeholders in the implementation of the program

Table 14

Computed Mean on the Partnership Building Component of STE Program

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter Pre-tation
		Mean	Mean	Mean	Mean				
1	The school establishes partnership with business and industries to help and enrich the learning of students in science and engineering.	2.60	2.20	2.36	2.49	2.41	MI	1.59	W
2	The school invites speakers from industry to articulate the minds of students on the significance of the program.	2.80	2.50	2.45	2.49	2.56	HI	1.44	S
3	The school offers partnership development program with parents to facilitate continuity in learning even outside the school premises.	2.60	2.70	2.64	2.60	2.64	HI	1.35	S
4	The school establishes strong partnership with the stakeholders and business enterprise.	2.80	2.40	2.27	2.42	2.47	MI	1.53	W
5	The school integrates in the curriculum the partnership between education and industry.	2.60	2.30	2.36	2.53	2.45	MI	1.55	W
6	The performance of the students improved as a result of partnership development plan initiated by the school.	2.40	2.40	2.64	2.32	2.44	MI	1.56	W
7	The parents become more active in taking part in decision making with the school leadership.	2.60	2.30	2.36	2.48	2.44	MI	1.56	W
8	The school provides opportunities for parents to observe the implementation of the program.	2.20	2.50	2.55	2.53	2.48	MI	1.52	W
9	Feedbacks from parents are used as valuable inputs for the improvement of the program.	2.40	2.30	2.72	2.51	2.48	MI	1.52	W
OVERALL		2.31	2.40	2.48	2.48	2.49	MI	1.51	W

Verbal Interpretation:

1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented), 2.51- 3.25 (Highly Implemented). 3.26- 4.00 (Exceptionally Implemented)

It is therefore deduced that the schools have no concrete plans on how they will encourage other stakeholders to participate in the program. Given this, the



Philippine Normal University

The National Center for Teacher Education

school must strengthen their linkages in different sectors most specially in the industry that would provide more opportunities to the students to see the relevance of what they are learning in special science program. Gibson et. al (2008) on their study revealed that the impact of public-private partnership on education positively improve the pupils performance, attitudes, behavior and attendance.

This weakness in the implementation of the program was also evident in the responses given to wit:

“ tingin ko nga dito kami medyo kulang sa partnership building hindi pa naming gaanong namamaximize ang partnership namin sa ibang stakeholders... gawa siguro ng malayo ang lugar namin. Although may mga alumni kami pero bihira namin silang itap”. (I think this is what our school is lacking, we are not maximizing our chance to establish partnership with the stakeholders- maybe because of the location of our schools. Although we have alumni but seldom we tap them)

Golfo (2012) in her dissertation about the stakeholders participation on school- based management found out that the stakeholders in the division of Lucena City were strong in their participation in the activities concerning to quality curriculum development, remedial and enrichment classes, learning at home, youth development program, community services, conduct of livelihood skills, family and community development and engagement and family support. She recommends that the internal stakeholders of various schools must maintain and sustain their strong



Philippine Normal University

The National Center for Teacher Education

participation in all the activities in the implementation of school based management. However, the gap in the indicators led her to the development of a policy framework which will help to strengthen the participation of stakeholders in school based management.

Sanders (2001) made an assertion that school- community partnership are not without obstacles. The obstacles include insufficient funding, time, and faculty, parent, and community participation. He opined that schools can collaborate with a variety of community partners to plan and implement partnership activities. In the same line, he summarized that community involvement can equip school to provide students with more relevant, challenging learning opportunities in nurturing environment. The most important in selecting partners is identifying community partners and develop partnership activities that will help them achieve goals that support students' learning and school improvement effort.

Cushing and Kohl (1997) identified three barriers to successful school-community collaborations: (a) fear of public scrutiny, (b) staff burnout, and (c) teachers' and administrators' negative perceptions of students' families and communities. Mawhinney (1994) and Epstein (1995) also identified barriers to effective collaborations with the community. According to them, one of the most pervasive hindrances to collaboration is territorialism, or, as Crowson and Boyd (1993) noted, "unresolved issues of information sharing, resource mingling and professional turf."



Philippine Normal University

The National Center for Teacher Education

The table presents the results of assessment given by the respondents on how financial management is implemented in the schools implementing the special science program in CALABARZON region.

Table 15

Computed Mean of Financial Management Component of STE Program

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter Pre-tation
		Mean	Mean	Mean	Mean				
1	There is a budget proposal presented to teachers, parents, and students.	2.80	2.00	1.91	2.09	2.20	MI	1.80	W
2	The school head involves the teachers, parents, and students in budget preparation for the program.	2.80	1.70	2.00	2.32	2.21	MI	1.79	W
3	The school receives fund from DepEd to support the implementation of the program.	2.80	2.40	2.73	2.52	2.61	HI	1.39	S
4	There is a clear provision as to how the fund would be allocated.	3.40	2.70	2.45	2.56	2.78	HI	1.22	S
5	The amount of fund received is sufficient to finance the implementation of the program.	2.40	1.60	2.45	2.16	2.15	MI	1.85	W
6	There is an available contingency plan for fund sourcing that will support the implementation of the program.	2.40	1.70	2.18	2.11	2.10	MI	1.90	W
7	The teachers, parents, and students are aware of the amount allocated for the implementation of the program.	2.80	1.40	2.09	2.16	2.11	MI	1.89	W
8	Transparency in the financial activities of the school is sustained.	3.40	2.60	2.56	2.33	2.72	HI	1.28	S
9	The utilization of fund is properly audited by the concern authorities.	3.60	3.00	2.73	2.37	2.93	HI	1.07	S
10	The school head organizes a team which will take charge in the utilization of funds	2.60	1.90	2.36	2.28	2.29	MI	1.71	W
11	The funds are allocated based on the priority and needs of the teachers and students.	3.00	2.40	2.45	2.26	2.53	HI	1.47	S
OVERALL		2.91	2.13	2.36	2.29	2.42	MI	1.58	W

Verbal Interpretation:

1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented),
2.51- 3.25 (Highly Implemented). 3.26- 4.00 (Exceptionally Implemented)

Table 16 exhibits the results of assessment of respondents in five schools implementing the special science program. The overall results manifest that the



Philippine Normal University

The National Center for Teacher Education

financial concerns is one of the weakness and moderately implemented in the schools implementation of the program. The recorded gap indicates that clear plans in financial concerns need to strengthen and enhancement. It can be deduced therefore that in order to demonstrate transparency in financial concern to support the implementation of the program proper accountability and utilization of fund must be observed. It is not mere informing teachers about the amount of fund allocated for the program but more so, delegate and involve them in planning, allocating, and spending of fund so that transparency will be observed.

Marishane and Botha (2004) coincide that the accountability of a person is measured by the extent to which the decisions taken and resources used succeed in attaining the educational goals.

Clark (2008) asserts that financial management is essential for school principals because it enables them to gain knowledge and understanding on the basic process involved in managing school accounts, the budgeting processes and the systems and controls that are necessary to ensure that the school's monies are not misappropriated. Similar view was asserted by Momoniat (2008) when he explains that financial management is a requirement of a manager in taking responsibilities for the actions and achievement in exchange for greater managerial discretion over their inputs. Thus, managers have to take responsibility for their performance.

Furthermore, the result was supported by the views of the respondents during the interview when they asked if they are aware about the subsidy for the program.



Philippine Normal University

The National Center for Teacher Education

They said:

“The school received fund to support the implementation of the program. We based the allocation of fund on the prescribed guidelines on the utilization of the fund issued by DepEd.”

“ I am not aware that our school receives fund to support the implementation of the program. if ever there is... I think the disbursing officer and our principal take charge of it. Anyway, we can request of materials and chemicals for the students in the special science class”.

“we are aware about the subsidy for the program because the the DepEd order is posted in the bulletin board and it is announced to us during the faculty meeting.”

Van Wyk (2004) opines that the objectives of the financial management in public sector is to support management in the allocation of limited resources with the purpose of ensuring economy and efficiency in the delivery of outputs required to achieve desired outcomes that would serve the needs of the community.

Leadership in financial administration involves three aspects: sound relationships, communication with all stakeholders and internal as well as external and motivation of all the people concerned with school finances (Bisschoff 1997). Bisschoff (1997) notes that “harmonious collaboration between academic and administration staff is a prerequisite for successfully achieving financial objectives”. Niemann (1997) believes that financial activities are dealt with most effectively when both the administrative and academic personnel are involved in the process. Communication is the basis for establishing relationships and for providing



Philippine Normal University

The National Center for Teacher Education

motivation (Niemann 1997). Bisschoff (1997) argues that good communication will ensure that each staff member who is involved in school finances would be informed about authorisations for various expenditures, is knowledgeable about the financial procedure for expending money, and knows to whom the results of the expenditure should be reported. Bisschoff (1997) emphasise that all staff members should feel that they have a role to play in all of the school's activities, as this will motivate them to work hard and consequently achieve effective and efficient financial administration.

Table 17 concerns about how the support system and how the schools implement this area. The data in the table revealed how the respondents assessed the indicators and their ratings were computed to determine the overall mean to generate interpretation and identify its strengths and weaknesses.

The overall result of the data in the table signifies that the support system is highly implemented in the five schools implementing the Science, Technology, and Engineering Program in CALABARZON region. The combined result in the assessment of the school heads, head teachers, master teachers, and teachers supported that this area is one of the strengths in the implementation of the program. However, a gap was recorded against the total quality assurance rating.

It can be inferred therefore that the gap does not achieve the standard hence the schools implementing the program need to enhance further their practices in supporting the students. It is timely that the schools, through the able leadership and management skills of the school heads and department heads, give equal attention



Philippine Normal University

The National Center for Teacher Education

and develop strategic approaches on how they can improve and extend more support for the students.

Table 16

Computed Mean of the Support System Component of STE Program

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter-Pre-tation
		Mean	Mean	Mean	Mean				
1	The school provides continuous counselling to the teachers, students and parents in the program.	3.00	3.00	2.55	2.42	2.74	HI	1.26	S
2	The mentoring and coaching programs in the school which support the teachers and students are maintained.	2.80	2.90	2.64	2.56	2.73	HI	1.27	S
3	There are agencies that provide instructional and technical support to the school for the proper implementation of the program.	2.60	2.60	2.36	2.40	2.49	MI	1.51	W
4	The regional and division supervisors in science and mathematics regularly visit the school to provide clinical supervision to the teachers and school head.	3.00	2.70	2.73	2.51	2.73	HI	1.27	S
5	The school head seeks the assistance of different agencies that could possibly help the implementation of the program.	3.00	2.90	2.45	2.40	2.69	HI	1.51	
6	There is an open communication line between school and parents to address some issues relative to the implementation of the program.	3.00	3.00	2.64	2.51	2.10	MI	1.90	W
7	The local government provides scholarship grant to the students enrolled in the program.	2.40	2.80	2.01	2.23	2.11	MI	1.89	W
8	There are entities that support the researches of the students.	3.40	3.20	2.64	2.42	2.72	HI	1.27	S
9	The organization of alumni exist that offer support to the students.	2.80	2.80	2.45	2.44	2.93	HI	1.07	S
10	There is an enrichment program initiated by school which help the students to understand their lessons.	2.80	2.90	2.55	2.30	2.29	MI	1.71	W
11	The school has functional library and research center which would help the students in their research activities.	3.00	2.50	2.36	2.28	2.53	HI	1.47	S
OVERALL		2.91	2.13	2.36	2.29	2.55	HI	1.45	S

Verbal Interpretation:

1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented), 2.51- 3.25 (Highly Implemented). 3.26- 4.00 (Exceptionally Implemented)



Philippine Normal University

The National Center for Teacher Education

Developing policy on how the schools can support the students may be a good approach in enhancing the practices in improving the support system of the schools implementing the program. Teachers have these to say:

“ although we have gained recognition in the regional and national competition especially in the investigatory projects of our students, still we need more support for the research projects of our students. We are hoping that there are other agencies who would support the result of the researches conducted by our students so that the significance of the results will be utilized by many. It is our experience that eventhough the research projects of the students are considerable innovative, however we received little support. We need more funding”.

“ how I wish, as research teacher, [that] our students will be given support by the local government and see the result of researches of our students as a vehicle in providing fund for the research enthusiast so that they will be get motivated in conducting more researches”.

“ I am very happy because for so many years I have been teaching in the program, I got a chance to attend the seminar in Cebu to update my competence in teaching the subject especially in environmental science. This updated my instructional competence and gain new insights in unpacking the content standards. I am looking forward that the BSE will provide us more trainings and follow- up in the years to come. What we need is consistency, especially in the giving follow up training”.

In the report presented by the BSE during the annual conference of the school heads revealed that the current condition of the facilities in the public schools

“The schools have basic instructional spaces including classrooms, science laboratories, computer room and library. However, the laboratories which are in need of major repair and renovation do not comply with the minimum standards as required in the Physical Facilities Guidelines and do not incorporate multi-hazard mitigation measures. Likewise, most schools have the basic administrative and service spaces like an administrative office and guidance room except a medical/dental clinic”.



Philippine Normal University

The National Center for Teacher Education

Table 18 elucidates how the schools implementing the program in CALABARZON region observe tracking of students in the program to satisfy the objectives of the program. Again, the respondents rated the indicators presented in the table as to how it is being implemented by the schools. The TQA is also used to categorize the strengths and weaknesses in the implementation of the program.

Table 17

Computed Mean of the Tracking of Students Component of STE Program

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter-Pre-tation
		Mean	Mean	Mean	Mean				
1	The office of the principal keeps record on the performance of students.	3.40	2.60	2.55	2.44	2.75	HI	1.25	S
2	The guidance office conducts researches relative to the performance of students in the program.	2.60	2.40	2.55	2.14	2.42	MI	1.58	W
3	The school calls the attention of parents and students for conference about the performance of the students in the program.	3.20	3.10	2.82	2.77	2.97	HI	1.03	S
4	The teachers identify students who need to be mentored to succeed in the program.	3.00	2.90	2.82	2.74	2.87	HI	1.13	S
5	The school has statistical data on the number of students who are accepted in the science and engineering/ mathematics courses in college.	3.00	3.10	2.36	2.47	2.72	HI	1.28	S
6	An assessment test is administered to track the level of learning of the students.	3.20	3.10	2.82	2.65	2.94	HI	1.06	S
7	The school has a provision in assisting the students to finish in the program.	2.80	2.90	2.64	2.47	2.70	HI	1.30	S
8	The school performs follow-up assessment of the students who graduated from the program.	2.60	2.50	2.45	2.26	2.45	MI	1.55	W
OVERALL		2.98	2.83	2.63	2.49	2.73	HI	1.27	S

Verbal Interpretation:

1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented), 2.51- 3.25 (Highly Implemented), 3.26- 4.00 (Exceptionally Implemented)



Philippine Normal University

The National Center for Teacher Education

The overall mean scores of 2.73 as rated by the four groups of respondents suggests that generally, tracking of students is highly implemented and thus considered as strengths of the program. The recorded gap of 1.27 from the intent TQA however, implies that schools implementing the program need to articulate their policy in tracking the performance of the students. The findings further suggest that the schools have to do more strategic approaches and enhancement in tracking the performance of students.

Looking at the table, six of the items were considered highly implemented while the other two were moderately implemented attaining the strengths and weaknesses in the tracking of students. The strengths is related to the school calls the attention of the parents and students for conference about the performance of the students in the program ($\bar{x} = 2.97$) and the school conducts assessment to track the level of learning of the students ($\bar{x} = 2.94$). These practices are evidently observed by the respondents and hence making the students aware that their performance in the program is seriously monitored. One school principal commented that:

“we are giving equal attention to all students here but with regards to the students in special science class, we see to it that we have all the records needed especially in their performance. I required the advisers to submit to my office the results of the cumulative performance of these students in all subjects. In this way, I have idea who are the students moving ahead and who are those who are left behind. Once we identified the students who are left behind, I call the attention of the teachers and ask how the students perform in his/ her class and what did they do to help the students. I ask them to show to me the evidence of learning of the students”.



Philippine Normal University

The National Center for Teacher Education

In contrast, the recorded weaknesses were related to guidance office conducts research relative to the performance of the students ($\bar{x} = 2.42$) and the school performs follow up assessment of the students who graduated from the program ($\bar{x} = 2.45$). The results showed that the schools do not have clear and existing guidelines on how the graduates will be tracked to whether they continue to take courses in college relevant to the program that they have attended. This further suggests that the planning and organizing skills of the school leaders really need to strengthen. In this way, for the program to be effective, schools offering special programs like the special science program must organize and formulate policies or guidelines on how students who graduated from the program will be tracked so that the feedbacks which they will gather will be used as inputs in enhancing the implementation of the program.

The work of Endriga which was presented in the assessment handbook (2013) supported that assessment is vital in any educational program. The K to 12 curriculum also spelled out holistic assessment process, which is guided by the set content and performance standard. Several levels of assessment are involved in each of the subject are to gauge a student's ability and capability.

In the descriptive survey research conducted by Balagtas et. al. (2010) on the literacy level of educational assessment of students in a premier teacher education institution revealed that the most critical role that teachers perform in the classroom is being an assessor of student's learning. The results of their assessment to students could either make or break their students' future. The findings revealed that the



Philippine Normal University

The National Center for Teacher Education

undergraduate and graduate students in the teacher education programs are weak in administering, scoring and interpreting the results of both externally- produced and teacher- produced assessment methods; using assessment results when making decisions about individual students, planning instruction, developing curriculum, and improving schools; developing valid student grading procedures; communicating assessment results to students, parents, other lay audiences, and other educators; and recognizing unethical, illegal and other inappropriate methods and uses of assessment information. In addition to these five weak areas, the undergraduate students are also weak at choosing assessment methods appropriate for instructional decisions, which is an area of strength of the in-service teachers surveyed. It is unfortunate that all the non -education degree holders who are earning units in education so that they could qualify as teachers of their discipline are weak at all areas of assessment literacy.

In the Philippines, Balagtas and Ferido (2007) revealed that teachers need training on assessment. This problem was viewed also by Department of Education when the department introduced alternative assessment which necessitates the use of rubrics and portfolios and other alternative methods of students' assessment.

The next table divulges how the respondents rated their implementation of the program in terms of monitoring and evaluation.

Table 19 revealed that the respondents rated monitoring and evaluation as moderately implemented ($\bar{x}=2.47$) in the five original implementing secondary



Philippine Normal University

The National Center for Teacher Education

schools of Science, Technology, and Education (STE) program in CALABARZON region. Meanwhile, a gap of 1.53 exists when compared to the total quality assurance rating of 4 hence it is considered as one of the weaknesses in the implementation of the special science program.

Table 18

Computed Mean of the Monitoring and Evaluation Component of STE Program

Item No	Indicators	School Heads	Head Teachers	Master Teachers	Teachers	Overall Mean	VI	Gap	Inter Pre-tation
		Mean	Mean	Mean	Mean				
1	There is a periodic assessment to monitor the implementation of the program.	3.20	2.80	2.36	2.40	2.69	HI	1.31	S
2	There is a committee tasks to assess the implementation of the program.	2.60	2.60	2.64	2.53	2.59	HI	1.41	S
3	The performance of the students in the program is constantly monitored and evaluated.	2.80	2.60	2.45	2.49	2.59	HI	1.41	S
4	The program is evaluated by experts in the desire to arrive in decisions which will help improve the effectiveness of the program.	2.60	2.50	2.55	2.49	2.54	HI	1.46	S
5	The results of evaluation are used as basis in improving the implementation of the program.	2.40	2.40	2.45	2.42	2.42	MI	1.58	
6	The data obtained after evaluation are presented to the teachers, students, and parents to identify the future actions to be taken for the program.	2.60	2.50	2.55	2.33	2.50	MI	1.50	W
7	The results of evaluation served as springboard in designing instructional plans for effective teaching and learning process.	2.40	2.40	2.55	2.37	2.43	MI	1.57	W
8	The findings of evaluation are used to inform the top management about the status of the program.	2.20	2.10	2.45	2.44	2.30	MI	1.70	W
9	The implementation of the program improves after evaluation.	2.40	2.10	2.36	2.42	2.32	MI	1.68	W
10	The result of evaluation reflects the strengths and weaknesses in the implementation of the program.	2.20	2.30	2.45	2.51	2.37	MI	1.63	W
11	The outcomes of evaluation results in recommendations relevant to the successful implementation of the program.	2.40	2.30	2.45	2.44	2.40	MI	1.60	W
OVERALL		2.53	2.42	2.48	2.44	2.47	MI	1.53	W

Verbal Interpretation:

1.00- 1.75 (Poorly Implemented), 1.76- 2.50 (Moderately Implemented), 2.51- 3.25 (Highly Implemented), 3.26- 4.00 (Exceptionally Implemented)



Philippine Normal University

The National Center for Teacher Education

The findings of the study revealed that monitoring and evaluation of the program is not given much attention by the schools. This is supported by the master teachers and teachers when they rated the school principals' weak ($\bar{x} = 2.40$) in the item that periodic assessment is done to monitor the implementation of the program. Similarly, school heads and head teachers revealed that the schools are weak in using the results of the evaluation to reflect the strengths and weaknesses of the program and in informing the top management about how the program is being implemented.

These revelations imply that the schools are not really consistent in monitoring and evaluating the implementation of the program. Some of the respondents exemplify these during the interview that:

"for the past years, we were only asked to submit the NAT result of our students in the program. I think it was in the year 2007 where the division supervisors came here and administered the test to the Students in the program but we were not provided of the result".

" Mrs. Abcede went here to monitor the program. She observed the class and asked some questions to the students. She also checked our laboratory and inquired how the fund intended to support the program is being utilized. I guess this is the first time that they are giving more directions and value about the program".

UNESCO (2012) monitoring involves the assessment of the progress made toward achieving a programme's goals and objectives. It includes the number of people reached, number and types of resources used, and other measures that show the completion of planned activities.



Philippine Normal University

The National Center for Teacher Education

Sallis (2002) forwarded that to ensure quality in a system it needs a feedback loop. Mechanisms must be in place to ensure that outcomes can be analysed against the plan. Monitoring and evaluation are key elements in strategic planning. If the institution is to be learning rather than a static organization, a process of evaluation and feedback must be an essential element in its culture.

The Educational Facilities Manual of DepEd (2010) states that monitoring and evaluation (M & E) are important managerial tools for planning, decision making, reviewing past actions, problem solving and improving future actions. Specifically, M & E facilitates organizational performance, measurement in terms of efficiency, effectiveness, economy and impact. M & E charts the progress of the organizations as they try to realize those performance measures.

In Africa and Asia, versions of Collaborative Action Research in Education (CARE) have been used successfully to engage teachers and school managers as genuine partners in monitoring, evaluation and research exercises. In this regard, great value has been attached to the unique experience and insight teachers bring to such exercises. Most teachers experience a professional transformation through their involvement with action research and go on to become more reflective in their own classroom practices. They tend to seek professional knowledge. Evaluation and monitoring must be presented to communities in a comprehensible manner if they are to participate meaningfully in the process.



Philippine Normal University

The National Center for Teacher Education

The study of Garcelo (1997) determined the intents and actualities of the program for non- science majors. The findings revealed that the strengths of the program were found in the purpose and objectives, faculty relations, professional performance and selection of academic staff. The weaknesses were found in the administration, science faculty development, teaching assignments, salary and fringe benefits and knowledge of the integrated science curriculum. Other weaknesses were curriculum and instruction, laboratories, libraries, and community involvement.

The recommendation includes continuing faculty development program in the form of trainings and seminars and use of the community- based approaches in teaching, community involvement policy to improve the quality of instruction through actual community involvement, and continuing communication among the science faculty administration and librarian to establish a strong science library thru procurement of the recommended science books. The researcher disclosed that this would enable the teachers to cope with the trends and breakthroughs in science teaching.

Jaminal (1999) recommends enhancement of faculty development program in the form of continuing education, in-service trainings, seminars and workshops using different methods, strategies, approaches in teaching relevant to subjects. This would enable the faculty to cope with trends and breakthroughs. Undertake substantial plans for continuous improvement and development of faculty workshop, students support and services, physical facilities, procurement of modern book, professional



Philippine Normal University

The National Center for Teacher Education

journals and publications, computers, modern equipment, supplies and materials in anticipation of technological and environmental challenges. Lastly, she strongly recommends that continuous establishment of linkages with industry and other colleges in the development of arts and science curricula to make them relevant and adapted to the needs of the society.

1.1. On the strengths and weaknesses of the program

Presented in table 20 the summary of the overall computed weighted mean in the nine (9) areas viewed as important elements of the special science program which serve as bases in assessing the status of implementation of the Science, Technology and Engineering (STE) program in the five original implementing secondary schools in CALABARZON region.

As observed in the table, the four groups of respondents perceived that the nine areas are the strengths of the schools in implementing the special science program as shown by the average mean score of 2.78. However, when the computed average mean is compared to the TQA, a gap of 1.22 is very evident.

The gap explicates that the skills and practices of the school heads in the management of the program needs enhancement and immediate attention so that all the weaknesses found in the implementation of the program will be given immediate actions and improvements.



Philippine Normal University

The National Center for Teacher Education

Analysis of the results revealed that the respondents of the five original secondary implementing schools rated curriculum management ($\bar{x} = 3.12$), student achievement ($\bar{x} = 3.10$), leadership ($\bar{x} = 3.00$), professional development ($\bar{x} = 2.96$), Management ($\bar{x} = 2.93$), tracking of students ($\bar{x} = 2.73$), and support system ($\bar{x} = 2.55$) as their strengths in implementation the program while partnership building ($\bar{x} = 2.49$), monitoring and evaluation ($\bar{x} = 2.47$), and financial concerns ($\bar{x} = 2.42$) were the identified weaknesses in the implementation of the program.

Table 19

Strengths and Weaknesses of Components of the Science, Technology, and Education (STE) Program

#	Description	Average Mean	TQA	Gap	Rank	Verbal Interpretation
1.1	Management	2.93	4	1.07	5	Strength
1.2	Leadership	2.89	4	1.11	3	Strength
2	Curriculum Management	3.12	4	0.88	1	Strength
3	Students' Achievement	3.10	4	0.90	2	Strength
4	Professional Development	2.96	4	1.04	4	Strength
5	Partnership Building	2.49	4	1.51	8	Weakness
6	Financial Concerns	2.42	4	1.58	10	Weakness
7	Support System	2.55	4	1.45	7	Strength
8	Tracking of Students	2.73	4	1.27	6	Strength
9	Monitoring and Evaluation	2.47	4	1.53	9	Weakness
Total		2.78		1.37		Strength

Moreover, all the computed means of the nine items showed disparity against the intended total quality assurance or TQA. It is very clear that the results indicate



Philippine Normal University

The National Center for Teacher Education

that enhancement in the management and practices in the implementation of the program need serious attention. This can be done by offering and designing policy and tangible framework that will serve as bases in strengthening the weaknesses found in these areas so that intended practices in the management and implementation of the program will meet the objectives.

2. *Based on the findings of the study, what management framework can be developed to enhance the implementation of Science, Technology, and Engineering (STE) Program in CALABARZON region?*

The findings of the study explicitly suggest that the practices in the management and implementation of special science program need to be enhanced by strengthening the areas that are critical in the implementation of the program. The gaps recorded in the areas being assessed supported the intention of the study to develop a framework which aims to enhance the management of the program so that the identified flaws and weaknesses will be given attention and be improved.

On the other hand, the areas where the average mean showed small gap in the intended TQA does not necessarily mean that enhancement is not needed at all. It is viewed in this study that all these areas are working as a whole and therefore, there should no part or area of the program will be overlooked. It is under the premise that for the program to be implemented well, critical areas in the management and implementation of the program will meet the total quality assurance hence, developing a framework to enhance the management and implementation of the



Philippine Normal University

The National Center for Teacher Education

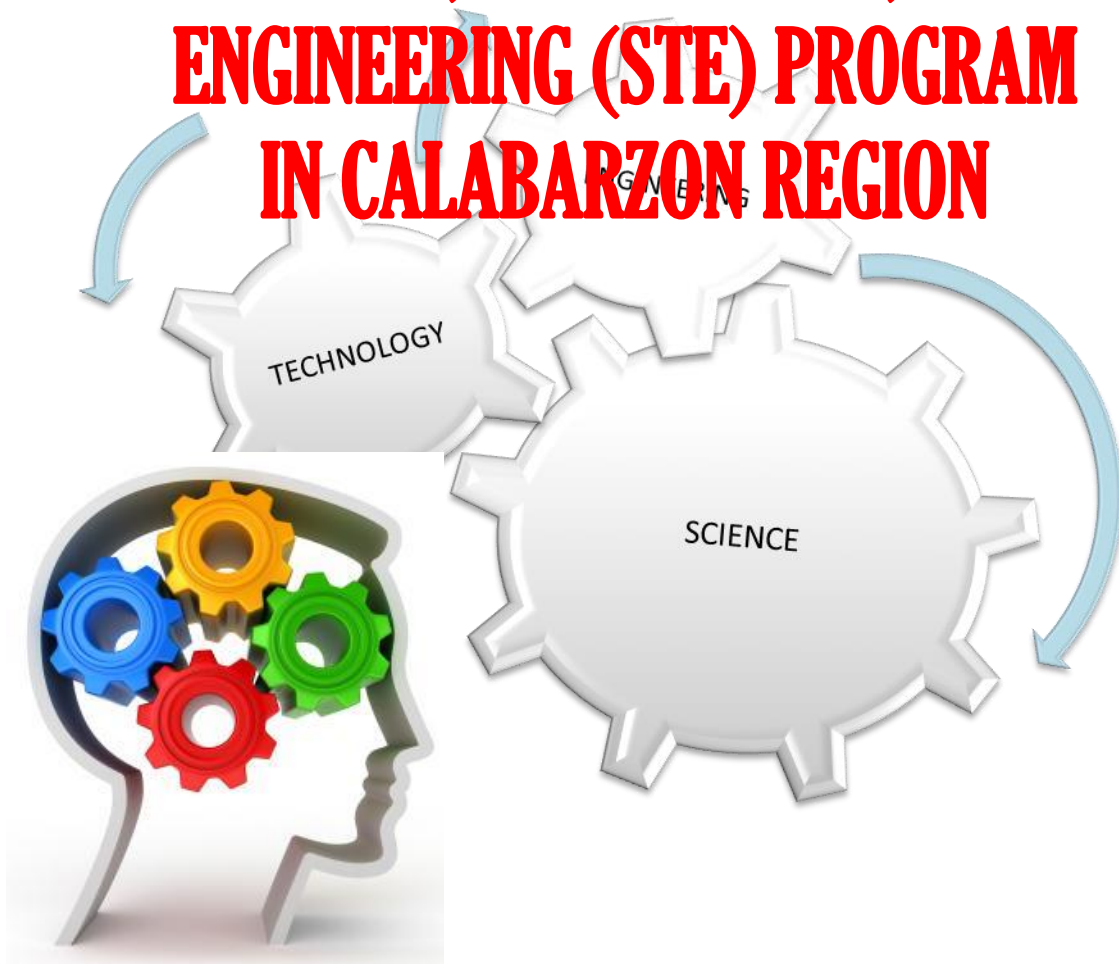
Science, Technology, and Engineering (STE) Program justify the purpose of the study.

Presented in the next page is the proposed management framework which aims to enhance the implementation of Science, Technology, and Engineering (STE) program in CALABARZON region.



Philippine Normal University
The National Center for Teacher Education

A MANAGEMENT FRAMEWORK TO ENHANCE THE SCIENCE, TECHNOLOGY, AND ENGINEERING (STE) PROGRAM IN CALABARZON REGION



ADRIAN CALDERON GUINTO



Philippine Normal University
The National Center for Teacher Education

Table of Contents

Background and Rationale

Purpose

Science, Technology and Engineering (STE) Program

Mission

Vision

Objective

STE PROGRAM MANAGEMENT ENHANCEMENT FRAMEWORK

Critical Areas in the Implementation of the Program

A. Management and Leadership

B. Curriculum Management

C. Students Achievement

D. Professional Development

E. Support System

F. Monitoring and Evaluation



Philippine Normal University

The National Center for Teacher Education

Background and Rationale

The significance of the effective leadership and management for the successful operation of the school is widely acknowledged in the 21st century (Bush, 2005). There is a wide consensus that there are no effective schools which are not governed by highly innovative leaders and effective managers. The growing demand for quality management in school operation has been seen in different literature espoused by different experts in school leadership and management. Their ability to effectively manage and lead the schools is revealed in the successful learning outcomes and implementations of education programs and policies. The increasing accountability of the school principals challenges them to make the schools as an avenue which promotes and nurture the intelligence and skills of students and teachers.

Science and Technology has been recognized as the foundation in the development of the society. Generally speaking, this discipline helps to improve the lives of people.

The Department of Education is committed in developing students who are equipped with skills in science, mathematics, and research who will contribute for the development of the society. Innovative programs and projects are introduced and implemented to achieve the goals of education.

The Science, Technology, and Engineering (STE) Program (formerly ESEP) is an innovative approach of DepEd in strengthening the science and mathematics



Philippine Normal University

The National Center for Teacher Education

education in the country. Its importance is also recognized by the present administration as the president of the republic, his Excellency Pres. Benigno Aquino, included the strengthening of science oriented schools in his ten (10) point agenda.

But despite of different initiatives, the performance of students in science and mathematics is still at far compared to the performance of other countries especially with those among developed countries.

There are several factors which can be contributed to the dismal performance of students in science and mathematics and it is very clear that one of the problems pressing the science education in the country can be related to the management practices in the implementation of the program. There is a growing appreciation in strengthening the projects and programs of DepEd in delivering quality education hence, it is timely to look at the effectiveness of the programs.

The assessment of Science, Technology, and Engineering (STE) Program was conducted to identify the status of implementation of the program particularly in CALABARZON region. The identified strengths and weaknesses in the components of the programs were used as bases in evolving a management framework which aims to enhance the implementation of the program in the CALABARZON region.



Philippine Normal University

The National Center for Teacher Education

Purpose of the Framework

The proposed STE Program Management Enhancement Framework aims to:

1. Guide and provide directions for effective management and implementation of Science, Technology, and Engineering (STE) Program in CALABARZON region.
2. Support the main thrust of the Department of Education in strengthening the Science, Technology, and Engineering (STE) Program.

STE PROGRAM

Vision

The program envisions highly responsible, morally upright, globally competitive, and work- ready learners from schools offering relevant and innovative Science, Technology and Engineering Education.

Mission

Shall be the center of excellence in Science, Technology, and Engineering education in the school divisions that shall develop the full potential of students along these areas.

Objectives

Aims to widen access to quality secondary education with the view to develop learners for careers in or for higher learning in Science, Technology, and Engineering.



Figure 3. Proposed Management Framework to Enhance the Science, Technology and Engineering (STE) Program



Philippine Normal University

The National Center for Teacher Education

Figure 3 illustrates the proposed management framework for the implementation of the Science, Technology, and Engineering (STE) Program which evolved from the findings of the study. The management framework can be used by the implementing schools of the program as basis in strengthening and providing more directions for the effective delivery of the program.

At the center of the proposed management framework is the effective implementation of the program which can be achieved by attaining, vision, mission, and objectives of the program. The VMGo guides and outlines the expectations for the effective and successful implementation of the program. The outer circle following the mission, vision, and goals are the classical management functions which are found deemed imperative for the successful implementation of the special science program. This includes planning, organizing, leading, and controlling in which the school managers must maximize in managing the key areas for the successful implementation of the program.

In planning, it means that the schools implementing the program would develop plans that outline the policies, strategies, and activities in each key area in order to achieve the objectives of the program.

In organizing, it means that the implementing schools would create a team who will be responsible in implementing the strategies and activities for the effective implementation of the program.



Philippine Normal University

The National Center for Teacher Education

In Leading, that the implementing schools through the able leadership of the school heads would establish and communicate the objectives and goals of the program to the teachers, parents, and students so that they will understand and work in the same vision towards effective implementation of the program. The school heads of the implementing schools are accountable and responsible for the effective and successful management of the program.

In Controlling, that the implementing schools would monitor and determine if the activities and strategies employed geared toward the achievement of vision and objectives of the program. This also involves the use of methods that measure the actual performance of teachers and students and the results would be used as bases in making sound decisions and corrective actions if necessary.

Meanwhile, the double head arrows linked the management functions to the six key areas of the proposed management framework. The double head arrows indicate that the activities to be done in each key area must be guided by management functions and reflect the VMGo for the effective implementation of the special science program.

In each segment of the hexagon are the key areas of the proposed STE Program management framework. The six key areas of the new framework include the management and leadership, curriculum management, student achievement, professional development, support system, and continuous improvement.



Management and Leadership

The management of the STE Program is a shared responsibility of the school heads, teachers, students, and parents of the implementing schools. In managing the program, they set goals, identify the needs, develop plans, implement, monitor, assess, and make decisions on the extent to which the plans, strategies, and policies achieved the objectives of the program. The school heads are also expected to provide and extend their leadership which ensures the successful implementation of the program. Presented below is the schematic diagram in managing the STE Program.



Figure 3. Schematic diagram in the management of STE Program



Philippine Normal University

The National Center for Teacher Education

Goal Setting

The first step for the successful management and implementation of the program is by establishing goals or objectives on how the vision and mission of the program will be achieved. The goals must be realistic and measurable so that the result can be easily checked. Goals must be established in participative fashion, which means the involvement of teachers, students, and parents, so that everyone accepts and understands them.

Need Analysis

Once the goal has been established, the need analysis must be done in order to determine how the goals will be attained. Need analysis includes elements which would identify the factors that are critical to the successful implementation of the program. This answers the questions what needs to be done to attain the objectives of the goals? What are the needs of the teachers to implement the program successfully? What are the needs of students in order to succeed in the program? How adequate are the resources to support the implementation of the program? These are among the questions that need to be given an answer so that the vision of the program will be attained.

Develop plans

The third step is to develop plans which address the identified needs in the implementation of the program. An action plan is an effective tool which will reflect



Philippine Normal University

The National Center for Teacher Education

the strategies and activities to be done for the program. The action plan must include areas that need immediate actions based on the need analysis, strategies or activities, time frame, persons involved, and expected outcome that would achieve the predetermine goals for the effective implementation of the program.

Implementation

Implementation is done after establishing the plans for the management of the special science program. Good plans are not good at all if it is not implemented. It takes courage and political will to implement plans especially if it denotes changes in the operations and implementation of the program. Therefore, it is important that the members will be involved, understand, and accept the plans so that everyone is in the same wavelength and speaking the same language during the implementation of plan.

Monitoring

Monitoring is a mechanism that effectively gathers feedback on status of implementation of the plans in accordance to the determined goals. Monitoring must be done in a regular basis so that details in the implementation of the plans will be documented. The information obtained during the monitoring phase can be served as inputs for planning, decision making, reviewing and improving future actions.



Philippine Normal University

The National Center for Teacher Education

Assessing

Assessment is a systematic and ongoing method of gathering, analyzing and using the information from the implementation to determine the extent the plans achieved the goals of the program. The assessment on the effectiveness of plans would provide feedback and information in making further decisions on how the program will be successfully managed and implement. The assessment would reveal if the course of actions done would achieve the goals and address the identified flaws that hinder the effective implementation of the program.

Organizational Structure

A clear organizational structure which would lead the program should be put in place to assure that the program will be implemented effectively and efficiently. The organization will be consisted of teachers who are directly involved in the implementation of the program. They are responsible for the planning, implementing, monitoring, and decision-making for the effective management of the program.

The school head would be the overall chairperson of the program assisted by the department heads of Science and Mathematics. In absence of department heads, the master teachers or subject coordinators can assist the school heads. The science and mathematics teachers who are also involved in the program are the members of



Philippine Normal University

The National Center for Teacher Education

the department heads. The committee ensures that the objectives of the program are met.

Curriculum Management

Curriculum is the heart of the educational system. The school heads are responsible for the management and implementation of that the prescribed and enriched curriculum intended for the special science program. The school heads and teachers ensure that all the learning activities are aligned to the desired goals of the curriculum.

To ensure proper management of the curriculum, the school heads must articulate and communicate the desired goals of the curriculum to the teachers and students. The school heads must identify the readiness and level of understanding of the teachers in implementing the curriculum. By identifying the level of understanding of the teachers, the school heads can get information and will arrive in sound decisions that could improve the teaching- learning practices. The school heads may conduct trainings and workshop which would acquaint and familiarize the teachers in different pedagogies that could aid them in delivering their lessons. As instructional leaders, school heads must support and provide an opportunity for the teacher to become proficient in delivering the curriculum. Teachers who have sufficient trainings in the implementation of the curriculum must be assigned to teach the special science class. The school heads may organize a team which would regularly monitor and assess the implementation the curriculum. The performance of



Philippine Normal University

The National Center for Teacher Education

the students can be used as barometer in determining if the desired goals of the curriculum are achieved. Constant supervision of the school heads and appraisal of the performance of the teachers and students can be done and use as basis in determining if the goals of the program are achieved.

Student Achievement

The student achievement focuses on the level of learning acquired by the students as manifested by their academic performance. The student achievement is a direct barometer of the performance of the schools implementing the STE Program. While it true that the fundamental goal of school improvement is to improve student learning at all cost. However, the performance of the students in science and mathematics would tell that there much more to raise their achievement.

The quality of teaching is one of the key determinants of the student learning and achievement. The knowledge of teachers in theories of learning, curriculum and subject matter, assessment, classroom management are among the factors which could be linked to the student achievement (Hammond and Bransford, 2005). Similarly, highly effective schools share characteristics which support the students achievement; a clear and focused vision; safe and orderly environment; climate of high expectations for students' success; focus on high level of student achievement that emphasizes activities related to learning; principals who provide instructional leadership; frequent monitoring of student progress; and strong home relations (Brophy, 2010). Students learn effectively when they have the opportunities to think



Philippine Normal University

The National Center for Teacher Education

in different levels, for different purposes, and in different context. The teachers can help the students to learn by using instructional strategies that lead them to think at high level.

To help the students improve their achievement level, the school heads must ensure that the learning environment could support the development of learning of the students. A diagnostic test must be administered as basis in identifying what the students already know and what the students need. The result of diagnostic test will be used as basis in linking the instruction and assessment to the curriculum. The school heads may identify the instructional needs of the science and mathematics teachers involved in the program so that appropriate trainings and workshop will be given to them specifically in terms of innovative teaching strategies. The school heads together with teachers may design plans and activities which would help and determine the success of students. The school heads may organize a team of teachers who would become tutor of students who are experiencing difficulties in their subject particularly in science and mathematics. The conduct of periodic assessment can be used in monitoring of students performance. The school heads and teachers can use the results of assessment in identifying the learning acquired by the students and could serve as basis in making decisions on the next steps to be done in improving the student achievement.



Philippine Normal University

The National Center for Teacher Education

Professional Development

Professional development of science and mathematics teachers is one of the areas that must be given equal attention of the school heads to ensure the effective implementation of the program. Professional development focuses on the enhancement of the competence, pedagogy, assessment and research skills of teachers assigned to teach in the special science class. Professional development is a key component in maintaining a skilled workforce and in producing quality teachers.

To support the professional development of teachers, the school heads through their able leadership must create a learning community which would support and nurture the professional growth of the teachers. One of the effective mechanisms in identifying the professional needs of the teachers is by conducting an analysis on professional needs of the each teacher. Through identification of the professional needs of teachers the school heads would have a picture of what kind of professional help they could extend to the teachers. They may include in their school improvement plan (SIP) the trainings or seminars needed by the teachers. They may organize school -based training and invite speakers who would provide and capacitate their pedagogy, assessment, and research skills. The schools may include in their proposal the attendance of the science and mathematics teachers in the seminars and trainings which would enhance their pedagogical and instructional competence especially in the implementation of K to 12. Since the implementing schools receive fund to support the program, the school heads may include in their



Philippine Normal University

The National Center for Teacher Education

proposal the attendance of science and mathematics teachers in graduate studies with specialization in science or mathematics.

Support System

Support system focuses to the assistance extended for the effective and efficient management of the program which will benefit and give opportunities to improve the learning of the students. The support system must support the school's goals for students learning, reflect the school's belief structures, and be consistent with the current research on teaching and learning. These matters are embodied in the philosophy of learning support.

On the other hand, to ensure that the financial support is properly and effectively utilized it is imperative that transparency is put in place.

Two components from the original framework were merged under the support system; the partnership building and financial management. It was evident in the study that the partnership building and financial concerns are the two areas which were found weak in the implementation and management of the program. Enhancing partnership and improving the financial concerns of the school implementing the program is one of the challenges pressing these schools.

Establishing relationship with potential partners in education would be beneficial to the school and the students. Establishing and strengthening partnership between the schools, industry, business and community is worthwhile investment of



Philippine Normal University

The National Center for Teacher Education

the school. In order to establish partnership, the schools must have an existing partnership program which articulates the objectives of partnership building. There must be clear guidelines on how and to whom the school will network with. A strategic plan must outline the activities and strategies to be done in establishing partnership with other stakeholders. The school heads may establish a resource mobilization committee headed by the program coordinator to ensure that there would be teacher or teachers who will take charge and responsible for the partnership building. The relationship with the partners must be sustained so that their trust and confidence will be remained in the schools. A representative from each sector may be invited as speakers or judges whenever there is a school program like symposium and seminars and other activities. Constant monitoring and periodic assessment of partnership program may be included as part of the strategic plans to ensure successful implementation of the partnership.

On the other hand, schools implementing the STE Program receive fund primarily to support the management and implementation of the program. It is imperative that the schools maintain a system which will ensure proper utilization of fund for accountability and transparency. For efficient use of fund, the schools are encouraged to prioritize the items that would improve the performance of students based on the need analysis when planning to avoid wastage of resources. A team of internal auditor may be formed by the school unless the school is an implementing unit. To ensure that proper procurement of the intended items are made, the school



Philippine Normal University

The National Center for Teacher Education

may develop appropriate procurement procedures which check the appropriateness of the procured items based on specifications. The utilization of fund must be monitored and reported properly.

Monitoring and Evaluation

The monitoring and evaluation are important managerial tools for planning, decision making, reviewing past actions, problem solving, and improving future action (Educational Facilities Manual of DepEd, 2010). The objectives of the monitoring and evaluation vary depending on the type of program and project (UNICEF, 2006). The general purpose of monitoring and assessment is to assess the effectiveness and efficiency of the program and its relationship to the original expectations.

Schools implementing the STE Program are worth to be monitored and evaluated to arrive in sound decisions which would further enhance the practices in the management and implementation of the program.

In monitoring the STE Program, the schools must develop a system which serves as guide on how the program is managed and implemented. The objectives in monitoring the program must be explicitly define to ensure that the purpose of the monitoring accords to the objectives of the program. There must be a team from the division office which will periodically monitor the implementation of the program. In school level, the school heads may organize a team that will monitor and



Philippine Normal University

The National Center for Teacher Education

systematically review the implementation of the program based on the results of the performance of students and teachers. Flaws in the implementation and management of the program must be reflected to be used as basis in future planning and actions.

Evaluation is a series of assessment conducted in order to arrive in sound decisions for the continuous improvement of the program. In evaluating the STE Program, it is important that the evaluators are aware in different evaluation models so that they guided of correct principles and be objective in giving comprehensive judgment. In order that the evaluation will become useful in program improvement, the evaluation plan should be drawn so that evaluators will be guided in gathering information and in giving decisions. The results of evaluation must be reported fairly and squarely and be made available for future use of others.



Philippine Normal University

The National Center for Teacher Education

Chapter V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Presented in this chapter the summary the research process, findings, conclusions drawn, and recommendations derived from the study.

Summary

The study assessed the implementation of the five (5) original secondary schools implementing the Science, Technology, and Engineering (STE) Program in CALABARZON region. The following are the areas considered in the assessment of the program; management and leadership; curriculum management; students achievement; professional development; partnership building; financial management; support system; tracking of students; and monitoring and evaluation of the program. The results served as basis in developing a management framework which aims to enhance the Science, Technology, and Engineering (STE) Program in CALABARZON Region.

The study employed the descriptive research design where survey was used in gathering information on the status of implementation of the STE Program using a researcher made validated questionnaire. The five original secondary implementing schools were the sources of information namely; Batangas National High School, Bauan National High School, Lipa City Science High School, Pedro Guevarra Memorial High School, and Quezon National High School. There were five school



Philippine Normal University

The National Center for Teacher Education

heads, ten Science and Mathematics Department heads, eleven Science and Mathematics Master teachers, and forty- three Science and Mathematics teachers who are directly involved in the implementation of the program participated in the study. The researcher conducted a semi- structured interview to verify the perceptions of the respondents reflected in the questionnaire.

The data was gathered, organized, tallied, and analyzed. The statistical processes and procedures include the frequency, weighted mean, and Cronbach Alpha.

Findings

The analysis and interpretation of data revealed the following:

1. Generally, the nine components used to assess the implementation and management of the Science, Technology, and Engineering (STE) Program in CALABARZON Regions are highly implemented. Management and leadership, curriculum management, student achievement, professional development, and tracking of students components of the program were highly implemented

On the other hand, the partnership building, financial management, support system, and monitoring and evaluation components of the program were moderately implemented.

1.1.Enhancement of the programs which were found weak is needed to achieve the objectives and for effective implementation of the program.



Philippine Normal University

The National Center for Teacher Education

2. The identified weaknesses in the management and effective implementation of the program led to the development of the management framework which aims to enhance the Science, Technology, and Engineering (STE) Program in CALABARZON region.

Conclusion

It can be concluded based on the findings of the study that the status of implementation of the Science, Technology, and Engineering (STE) Program in CALABARZON Region needs enhancement particularly in the weakest areas of the program. Management indeed plays a crucial and vital role in the implementation of any program relevant to Science and Technology. The development of a framework is a good help in the part of the implementing schools tracking down the status of the program for effective implementation.

Recommendations

The significant findings and conclusion presented in the preceding section worth a continuation of the assessment on the status of implementation of the program. The following specific recommendations are offered to ensure effective implementation of the Science, Technology, and Engineering (STE) Program in CALABARZON region.



Philippine Normal University

The National Center for Teacher Education

1. Enhance the management functions of the school heads in the schools implementing the program through instituting training which would strengthen their management practices.
2. Ensure the active participation of those who are involved in the program by involving them in developing plan for the program and delegating the tasks so that they will develop a sense of ownership in implementing the program.
3. Tap other teachers to conduct a classroom based action research clinic/ workshop so that teachers involved in the implementation of the program will be guided on how to improve the implementation of the program based on the result of the action research.
4. Form a team who will constantly monitor and assess the implementation of the program. Aside from the department heads who are usually designated as the program coordinator, they may be assisted by other teachers who have knowledge in assessing the program. The functions and responsibilities of the members of the team must be articulated so that they will focus on what is really intended to monitor and assess. The school may invite at least two persons who are used in assessing school program and projects so that feedback from the experts will be used as additional inputs for the proper implementation of the program.



Philippine Normal University

The National Center for Teacher Education

5. Adopt and/ or develop assessment tools that will be used assessing the program. Evaluation model like CIPP, Provus Discrepancy model and other appropriate evaluation model may be used to evaluate the program.
6. Develop a team who will be in-charge in strengthening the linkage of the program in other agencies. Partnership with industries like industrial parks might be a good network so that students would gain understanding about the significance of the program in building and developing society.
7. Develop a standard assessment tool may be developed as basis in monitoring the program.
8. Future researchers who would like to assess the program may develop an enhancement program as an output.
9. Make use of the management framework developed as output of this study, especially the schools which are newly implementing the program so that these schools will be guided on the proper management of the program.
10. Further studies, perhaps, on the impact of the program to the career path of the students.



Philippine Normal University

The National Center for Teacher Education

References

Books

- Anderson, Lesley, A. R.J. Briggs, and N. Burton (2002) *Managing Finance, Resources and Stakeholders in Education*. Center for Educational Leadership and Management. Sage Publications Ltd.
- Armstrong, Michael (2009). *Armstrong's Handbook of Management and Leadership: A guide to Managing for Results*. 2nd Edition. Kogan Page Limited. 120 Pentonville Road, London, N19JN United Kingdom
- Baum, J.R., Locke, E.A. and Kirkpatrick, S.A. (1998) '*A longitudinal study of the relation of vision and vision communication to venture growth in entrepreneurial firms*', *Journal of Applied Psychology*, 83(1): 43–54.
- Bass, B. M., & Avolio, B. J. (1994). *Improving organizational effectiveness through transformational leadership*. Thousand Oaks, CA: Sage.
- Bennis, W. (2003). *On becoming a leader*. New York: Basic Books.
- Bennis, W., & Nanus, B. (2003). *Leaders: Strategies for taking charge*. New York: Harper & Row.
- Bischoff, T. (1997). *Financial School Management Explained*. Pretoria: Kasigo Tertiary.
- Bishop, John H. and Mane, Ferran (2003). *The Impact of School- Business Partnership on the Early Labor- Market Success of Students*. Cornell University ILR School.
- Blanchard, K., Zigarmi, D., & Zigarmi, P. (1985). *Leadership and the one minute manager: Increasing effectiveness through situational leadership*. New York: William Morrow.
- Brent Davies (2006) *Leading the Strategically Focused School Success and Sustainability* Paul Chapman Publishing A SAGE Publications Company 1 Oliver's Yard 55 City Road London EC1Y 1SP
- Brent, Brian O and K. S. Finnigan (2008). *Financial Management in New York Charter Schools*. Warner School of Education, University of Rochester.



Philippine Normal University

The National Center for Teacher Education

- Bush, Tony (2011) *Theories of Educational Leadership and Management* Sage Publications, Ltd.
- Bush, Tony, L. Bell, and D. Middlewood (2010). *The Principles of Educational Leadership and Management*. Sage Publications, Ltd.
- Campbell, A. and Yeung, S. (1990) 'Do you need a mission statement?' Ashridge Strategic Management Centre, Special Report No. 1208. London: Economist Publications.
- Clarke, A. (2007). *The Handbook of School Management*. Cape Town: Kate McCallum.
- Connelly, F. Michael, Ming Fang He, and JoAnn Phillion (2008) *The Sage Handbook of Curriculum and Instruction*. Sage Publications, Inc.
- Covey, S. R. (1989). *The 7 habits of highly effective people: Powerful lessons in personal change*. New York:
- Crosby, P.B (1978). *Quality is Free*, McGraw- Hill, New York
- Daft, Richard L. (2000). *Management*. Chicago: The Dryden Press.
- Danielson, Charlotte (2002). *Enhancing Student Achievement: A Framework for School Improvement*. Association for Supervision and Curriculum Development. 1703 N. Beauregard St. Alexandria, VA 22311- 1714 USA.
- Davies, B. (2007) *Developing Sustainable Leadership*. London: Sage
- Deming, W.E (1986) *Out of the Crisis*, MIT Center for Advanced Engineering, Boston MA
- Du Preez, P. B. Grobler, C, Looock, SM, Shaba (2003). *Effective Educational Management Series, Module 5: Managing School Finances*. Sandown: Heinemann Publishers.
- Drucker, Perter F. (1954). *The Practice of Management*. New York: Harper and Row.
- Eakle, A. Jonathan (2012) *Curriculum and Instruction*. Sage Publications, Inc
- Erickson, H. Lynn (2002). *Concept- Based Curriculum and Instruction: Teaching Beyond and Facts*. Corwin



Philippine Normal University
The National Center for Teacher Education

- Fitzpatrick, J., Sanders, J., & Worthen, B. (2011). *Program evaluation: Alternative approaches and practical guidelines (4th Ed.)*. New York: Allyn & Bacon. Canadian Publisher: Pearson. ISBN: 978-0-205-57935-8
- Follett, M P (1924) *Creative Experience*, Longmans Green, New York
- Fiedler, F E (1967) *A Theory of Leadership Effectiveness*, McGraw-Hill, New York
- Fullan, M. (1990). *Staff Development, Innovation and Institutional Development, In Changing School Culture through Staff Development*, Alexandria, VA: ASCD.
- Fullan , M. (2001). *Leading in a Culture of Change*. San Francisco, CA: Jossey-Bass
- Gill, R. (2001) '*Beyond transformational leadership*', paper presented at Bernard M. Bass Festschrift, Binghamton, New York.
- Goleman, D (2000) *Leadership that gets results*, *Harvard Business Review*, March–April, pp 78–90
- Graen, G (1976) *Role-making processes within complex organizations*, in *Handbook of Industrial and Organizational Psychology*, ed M D Dunnette, pp 1201–45, Rand McNally, Chicago, IL
- Grint, K (2000) *The Arts of Leadership*, Oxford University Press, Oxford
- Glatthorn, Allan A, and Jailall, Jerry M. (2009). *The Principal as Curriculum Leader: Shaping What is taught and tested (3rd Edition)*. Sage Publications, Inc.
- Glatthorn, Allan A., Floyd Boschee, Bonni F. Boschee and Bruce M. Whitehead (2012). *Curriculum Leadership: Strategies for Development and Implementation*. 3rd Edition. Sage Publications, Inc.
- Goldberg, Mark (2001). *Lessons from exceptional school leaders*. Association for Supervision and Curriculum Development 1703 N. Beauregard St. • Alexandria, VA 22311-1714 USA
- Goyder, Hugh and N. Marriott (2009). *Manual for Monitoring and Evaluating Education Partnership*. International Institute for Educational Planning. 7-9 rue Eugne Delacroix, 75116 Paris, France.



Philippine Normal University
The National Center for Teacher Education

- Gratton, L. (2000) *Living Strategy: Putting People at the Heart of Corporate Purpose*. London: Financial Times – Prentice Hall.
- Greener, Tony (2010) *Understanding Organizations: Part I*. 1st edition. ISBN 978-87-7681-537-0
- Halpin, A W and Winer, B J (1957) *A Factorial Study of the Leader Behaviour Descriptions*, Ohio State University Press, Ohio
- Hersey, P and Blanchard, K H (1998) *Management of Organizational Behaviour*, Prentice Hall, Englewood Cliffs, NJ
- Higgs, M (2006) *Change and its Leadership*, Rowland, Fisher, Lennox Consulting [Online] www.rflc.co.uk
- Holden, Debra J. and M. A. Zimmerman (2009). *A Practical Guide to Program Evaluation Planning. Theory and Case Examples*. SAGE Publications, Inc.
- Hough, J. R (1993). *Financial Management in Education*. Loughborough Univesity, U.K.
- House, R J (1971) *A Path-Goal Theory of Leader Effectiveness*, *Administrative Science Quarterly*, **16**, pp. 321–38
- House, R et al (2004) *Culture, Leadership and Organization: The GLOBE study of 62 societies*, Sage, Thousand Oaks, CA
- Ivancevich, J M, Konopaske, R and Matteson, M T (2008) *Organizational Behavior and Management*, 8th edn, McGraw-Hill/Irwin, New York
- Joyner, Edward T., Ben- Avie, Michael, and Comer, James P. (2004). *Dynamics Instructional Leadership to Support Student Learning Development*. Corwin.
- Juran, J. M (1988) *Quality Control Handbook*. McGraw- Hill, Maidenhead
- Kelly A. V (2009). *The Curriculum: Theory and Practice (6th Edition)*. Sage Publication Ltd. Goldsmith College, University of London
- Keelye, Page (2005) *Science Curriculum topic Study: Bridging the Gap Between Standards and Practice*. Corwin and National Science Teachers Association.
- Kotter, J P (1991) *Power, dependence and effective management, in Managing People and Organizations*, Gabarro, pp 33–49, Harvard Business School Publications, Boston, MA



Philippine Normal University
The National Center for Teacher Education

- Kratz, Robert N, C. A Scott, and H. T. Zechman (2001). *The Primer on School Budgeting*. The Scarecrow Press, Inc. A Scarecrow Educational Book Lanham, Maryland, and London
- Leech, Nancy L., K.C. Barrett, and G. A Morgan (2011) *IBM SPSS for Intermediate Statistics Use and Interpretation. 4th Edition*. Routledge Taylor and Francis Group. 711 Third Avenue, New York. NY 10017.
- Maslow, A. (1954) *Motivation and Personality*, Harper & Row, New York
- McEwan, E.K. (2003). *Ten Traits of Highly Effective Principals*
- Nunnally, J. (1978). *Psychometric Theory*. New York: McGraw- Hill
- Oakes, J. (2005). *Keeping Track: How Schools structure inequality*. New Have, Conn. Yale University Press. Corwin Press. Inc.
- Patton, Q. M. (1997). *Utilization focused evaluation: The new century text (3rd Ed.)*, London: Sage Publications.
- Poston, William Jr. K. (2011) *School Budgeting for Hard Times: Confronting Cutbacks and Critics*. Corwin
- Quinn, T. (2005) *Principal preparation programs: Problems, prospects, and promising practices*, Lanham, MA; Rowman and Littlefield Education.
- Robbins, Stephen P. and M. Coulter (2012). *Management. 11th Edition*. Pearson Education, Inc., One Lake, Street, Upper Saddle River, New Jersey 07458
- Sallis, Edward. (2002) *Total Quality Management in Education (3rd edition)*. Kogan Page Ltd 120 Pentonville Road London N1 9JN UK
- Sanchez, Jose Rizal G. (1996) *Supervision as Management and Development in Philippine Setting*. Saint Bernadette Publications , Inc. 3335 V. Mapa St., Sta. Mesa, Manila
- Sanders, Mavis G (2006) *Building School- Community Partnerships; Collaboration for Student Success*.
- Schiro, Micheal Stephen (2013). *Curriculum Theory: Conflicting Visions and Enduring Concerns 2nd Edition*. Sage Publications, Inc. Boston College USA



Philippine Normal University
The National Center for Teacher Education

- Sevilla, Consuelo G. et.al (1992). *Research Methods*. Revised ed. Manila.: Rex
- Slater, Robert (2003). *29 Leadership Secrets from Jack Welch. Abridge from Get Better or Get Beaten, 2nd Edition*. McGraw- Hill companies, Inc.
- Sorentson, Richard D., L. M. Goldsmith, Z. Y. Mendez, and K. T Maxwell (2011). *The Principal's Guide to Curriculum Leadership*. Corwin
- Stufflebeam, D. (2003). *The CIPP model of evaluation*. In T. Kellaghan, D. Stufflebeam & L. Wingate (Eds.), Springer international handbooks of education: International handbook of Educational Evaluation.
- Topping, Peter A. (2002). *Managerial Leadership. The Mc Graw- Hill Executive MBA Series*. The McGraw-Hill Companies, Inc.
- Wiles, Jon (2009). *Leading Curriculum Development*. Sage Publishing ,Inc.
- UNESCO (2006). *Budget and Financial Management*. International Institute for Educational Planning. 7-9 rue Eugene Delacroix, 75116 Paris
- Bentillo, E. N. et. al (2003) *Supervision of Science and Mathematics Teaching*. National Institute for Science and Mathematics Education Development, University of the Philippines, Diliman, Quezon City Philippines.
- Wiles, J. and Bondi, J. (2007). *Curriculum development: A guide to practice . 7th Edition*. Upper Saddle River, NJ: Prentice Hall.
- Yukl, G. A (2002) *Leadership in Organizations. 5th Edition*.Upper Saddle River, NJ. Prentice- Hall
- Woods, Philip A. Woods Paul Chapman (2005) *Publishing A SAGE Publications Company* 1 Oliver's Yard 55 City Road London EC1Y 1SP

Journals/ Articles

- Albert, Jose Ramon G. and Maligalig, Dalisay S. (2008). *Measures for Assessing Basic Education in the Philippines*. Discussion Paper Series No. 2008- 16. Philippine Institute of Development Studies.
- Albert, Angela, J.P Armcost, P.S. Krist, and B.R. Selim (2008). *Program Assessment Handbook: Guidelines for Planning and Implementing Quality Enhancing Efforts of Program and Student Learning Outcomes*. University of Central Florida



Philippine Normal University

The National Center for Teacher Education

- Annenberg Insititute for School Reform at Brown University (2006). *Tools for School Improvement Planning*. Providence.
- Balagtas, Marilyn U. et. al. (2010). *Literacy Level on Educational Assessment of Students in a Premiere Teacher Education Institution: Basis for a Capability Building Program*. Philippine Normal University, Manila. The Assessment Handbook. Vol. 4(1) December, 2010.
- Bush, Tony (2007). *Educational Leadership and Management: Theory, Policy, and Practice*. South African Journal of Education. Vol. 27 (3) 391- 406
- Bush, Tony (2003). *Theories of Educational Management*. National Council of Professors of Educational Administration. Connexions Module: m13867.
- Department of Education (2001). *Massachusetts Science and Technology/Engineering Curriculum Framework*.
- Edmonson, Stacey, J. Hemmen, and J.R. Slate (2009). *Standards for School Leadership Program: A conceptual analysis*. International Journal of Educational Leadership Preparation. Volume 4, Number 2.
- Elevazo, A. O (1968). *Educational Research and National Development*. Manila: National Science Development Board.
- Gibson, Helen, and B. Davies (2008). *The impact of Public and Private Partnership on Education: A case study of Sewell Group Plc and Victoria Dock Primary Schools*. International Journal of Educational Management, Vol. 22.
- Ghaviferk, S., M. Sahari, and A. Salleh (2012). *Management Strategies for E-learning System as the Core Component of Systematic Change: A Qualitative Analysis*. Life Science Journal.
- Ibe, Milagros D. *Performance of the Special Science Classes in the 110 S & T-Oriented High Schools Along Science, Mathematics, and English SY. 1993-1994 to 1997- 1998*. Annual Report on the Achievement of Students in the S & T- oriented high school. University of the Philippines, College of Education, Diliman, Quezon City.
- Levinson, Henry (1970), *Management by Whose Objectives?* Harvard Business Review.
- Magno, C. (2010). *A Brief History of Educational Assessment in the Philippines*. Educational Measurement and Evaluation Review.



Philippine Normal University

The National Center for Teacher Education

Menon, Maria E. (2013). *The Link between Distributed Leadership and Educational Outcomes: An Overview of Research*. World Academy of Science, Engineering and Technology.

Ogena, , E.B and Brawner F. (1998). *Science Education in the Philippines: Challenges for Development*, Vol. 1, Metro Manila, SEI Department of Science and Technology.

Ware, Sylvia A. (1992). *The Education of Secondary Science Teachers in Developing Countries*. Educationa and Employment Division Population and Human Resources Department. The World Bank. Document No. PHREE/92/68

Zegarac, George (2012). *21st Century Leadership: Looking Forward*. Fall 2012. Volume IV. Issue 1. ISSN 1922-2394 (PDF).

Memoranda/ Issuances

Department of Education. "*Promulgating the Implementing Rules and Regulations (IRR) of Republic Act No. 9155 Otherwise known as the Governance of Basic Education Act of 2001*". DepEd Order No. 1, s. 2003.

Department of Education (2010). *DepEd Educational Facilities Manual. Revised Edition of the 2007 Handbook on Educational Facilities Integratign Disaster Risk Reduction in School Construction. Physical Facilities and School Engineering Division Office of Planning Service*. Department of Education. Pasig City.

DepEd Order No. 38, s. 2013. *Guidelines on the Utilization of Support Fund for School Implementing the Science, Technology, and Engineering Program*. retrieved from <http://DepEd.gov.ph> on September 30, 2013.

DepEd Order No. 60, s. 2011. *Implementing Guidelines on the Direct Release of Maintenance and Other Operating Expenses (MOOE) Allocations of Schools to the Respective Implementing Units*. Retrieved from <http://DepEd.gov.ph> on September 30, 2013.

DepEd Order No. 83, s. 2012. *Implementing Guidelines on the Revised School-Based Mangement (SBM) Framework, Assessment Process and Tool (APAT)*.



Philippine Normal University

The National Center for Teacher Education

Conference

- Betts, Julian R. (2011). *The Economics of Tracking in Education*. CESifo conference Economics, Munich.
- Ogena, E.B, R. B Laña, and R. S Sasota (2010). *Performance of Philippine High Schools with Special Curriculum in the 2008 Trends in International Mathematics and Science Study (TIMMS- Advanced)*. 11th National Convention on Statistics (NCS). Edsa Shangri- La Hotel. October 4- 5, 2010

Internet Source

- Bush, Tony (2006). *Theories of Educational Management*. Retrieved from <http://www.cnx.org/content/m13867> downloaded on December 15, 2013.
- Joshi, Manmohan (2012). *Administration Skills*. Bookboon.com
- Management Standards Centre (2004) *Management Standards* [Online] www.management-standards.org
- Stufflebeam, D. (2003). *The CIPP model of evaluation*. In T. Kellaghan, D. Stufflebeam & L. Wingate (Eds.), Springer international handbooks of education: International handbook of educational evaluation. Retrieved from http://www.credreference.com.ezproxy.lib.ucalgary.ca/entry/spredev/the_cipp_model_for_evaluation
- Swartz, Leslie (2008). *Financial Management of Schools*. Retrieved from <http://cnx.org/content/m32026/1.1/> on July 1, 2012

Unpublished Dissertation

- Andujare, Susana B. (2009). *An Assessment of the Biology Program of Selected Science High Schools in Metro Manila: Basis for Developing A Quality Strategic Plan*. Unpublished Dissertation. Philippine Normal University, Manila.
- Balajadia, Dexter M. (2012). *Emerging Leadership Model- Framework for Teacher Education Institutions Drawn from the Lens of Regular and Outstanding Basic Education Teachers*. Unpublished Dissertation, Philippine Normal University, Manila.



Philippine Normal University

The National Center for Teacher Education

- Chua, Elisa N. (2013) *A Proposed Human Resource- Based Framework for School Effectiveness*. Unpublished Dissertation, Philippine Normal University, Manila.
- Falogme, Jose Jr. D. (2011). *Assessment of Public Secondary School Principals' Management Functions and Students Services in a Division: Basis for the Development of a Handbook*. Unpublished Dissertation. Philippine Normal University, Manila.
- Garcia, Marife M. (2012) *Assessment of a State University Graduate Studies Program in Educational Management: Basis for Program Enhancement*. Philippine Normal University, Manila
- Golpo, Roselyn Q. (2012). *A Policy Framework Towards Enhancing Stakeholders' Participation on School- Based Management*. Unpublished Dissertation, Philippine Normal University, Manila.
- Jaminal, P.C (1999). *An Evaluation of the Arts and Science Programs of the University of Perpetual Help Systems: Basis for Quality Assurance*. Unpublished Dissertation. Philippine Normal University, Manila.
- Joven, Jayson S. (2006). *Leadership Style of the Department Heads of State University Systems: Basis for Development of Leadership and Management Handbook*. Unpublished Dissertation, Philippine Normal University, Manila.
- Namit, Julie Grace G. (2013) *Proposed Program Package in Enhancing the Managerial Skills of Academic Chairs in D.C Run Institutions*. . Unpublished Dissertation, Philippine Normal University, Manila.
- Ntseto, VE (2001). *Evaluation of the Implementation of the Financial Policy on Budgeting in Public Schools in the Free State*. M.Ed. Dissertation. Unpublished. Bloemfontein: University of Vista.
- Omalin, Conchita T. (2012) *Proposed Guidelines in Leadership and Management Competencies of School Heads: Basis for Managing for Excellence*. . Unpublished Dissertation, Philippine Normal University, Manila.
- Paule, Aurora (2004) *Financial Management Practices and Performance of Selected Private and State University Cooperative in Metro Manila*. Unpublished Dissertation. Technological University of the Philippines.



Philippine Normal University

The National Center for Teacher Education

- Rondilla, Marjorie Z. (2012). *Teacher Education Standards for Private Higher Education Institutions in a Province*. Unpublished Dissertation, Philippine Normal University, Manila.
- Recto, A. (2009). *Initial Assessment of the Responsibilities of Public Elementary School Principals in a Division using School- Based Management (SBM) Model: Input to Leadership and Management Guidelines Formulation*. Unpublished Dissertation, Philippine Normal University.
- San Antonio, Diosdado (2006) *Effective Participatory School Administration, Leadership, and Management (PSALM): Its Impact on the Creation of Better Philippines Public Secondary Schools*. University of Newcastle, Austria
- Santiago, Ronaldo P. (2012). *Proposed Competency Enhancement Program on Curriculum Development for Teachers in a City School Division*. . Unpublished Dissertation, Philippine Normal University, Manila.
- Somido, Ferdinand (2004). *Administrative and Supervisory Management Skills of Managers in a Private University System*. Unpublished Dissertation, Philippine Normal University, Manila.



Philippine Normal University
The National Center for Teacher Education

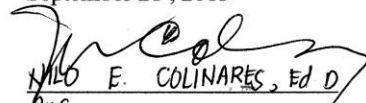
Appendix A

**LETTER TO EXPERT VALIDATORS FOR THE VALIDATION OF THE
SURVEY QUESTIONNAIRE**

(Sample Only)

Philippine Normal University
The National Center for Teacher Education

September 28 , 2013


MILLO E. COLINARES, Ed D
Professor
Philippine Normal University - Manila

Dear Dr. Colinares,

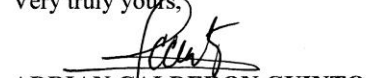
Greetings!

I, the undersigned, am currently working on my dissertation entitled “Development of a Management Framework to Enhance the Engineering and Science Education Program (ESEP) in CALABARZON Region” in partial fulfillment of the requirements for the degree, Doctor of Philosophy in Education with specialization in Educational Management at the Philippine Normal University, Manila. The study intends to assess the status of implementation of the said program and the result will be a basis in developing a management framework for program enhancement.

Knowing your expertise in the field of Educational Leadership and Management, I would like to request you to be one of the expert validators to attached research instrument. Your inputs would further contribute for the refinement of the instrument.

Thank you.

Very truly yours,


ADRIAN CALDERON GUINTO
Ph. D. Student

Noted by:


Danilo K. Villena, Ph. D
Adviser


Alejandro Ibanez, Ph. D
Co- Adviser



Philippine Normal University
The National Center for Teacher Education

Appendix B

**QUESTIONNAIRE FOR VALIDATION
(Portion Only)**

#	1.1.Management and Leadership	4	3	2	1	Remarks/ Revision
1.1.1.	Planning					
1	Sets clear plans and directions for the program.					
2	States clearly the plans for the achievement of the goals of the program.					
3	Formulates policies, program, and activities to help achieve the objectives of the program.					
1.1.2	Organizing					
2.	Has a clear structure and organization which defines the responsibilities of school head, teachers, parents, and students.					
6.	Has functional structure that monitors the implementation of the program.					
10.	Establishes an organize structure that clarifies working relationship of school head, teachers, students, and parents.					
1.1.3	Leading					
6	Provides organizational direction to sustain the program.					
7	Encourages teachers to be creative in implementing activities in support to the program.					
1.1.4	Controlling					
1	Monitors and asses the performance of teachers and students.					
7	Conducts performance review of teachers and students.					
1.1.2	Leadership					
5	Provides resources for the implementation of the program.					
6	Facilitates collaborative efforts among teachers.					
11	Promotes positive school culture.					
18	Allows teachers to perform instructional leadership towards improved result.					
19	Shares the objectives, targets, and performance measures for the improvement of the program.					
20	Designates other teachers to assume leadership					



Philippine Normal University

The National Center for Teacher Education

	tasks for the program.					
	1.2. Curriculum Management					
1	The school head and teachers are equipped with knowledge about the curriculum of the program.					
14	The teachers are able to deliver the subject matter with confidence					
15	The teachers present the lesson according to the approach embedded in the curriculum.					
16	Research skills of students are emphasized in their learning.					
	1.3. Students' Achievement					
2	The learning environment is conducive for the learning of the students.					
5	Performs periodic assessment that measures the achievement students.					
6	Teachers use innovative teaching strategies to support the learning of students.					
	1.4. Professional Development					
1	Teachers involved in the implementation of the program attend seminars, workshop, and training which will enhance their competence in teaching the students under the program.					
11	The professional development given to the teachers is congruent to mission, vision, goals, of the program.					
	1.5. Partnership Building					
1	The school establishes partnership with businesses and industries to help and enrich the learning of students in science and engineering.					
5	The school has partnership development plan for parents, community and business					
8	The parents become more active and take part in the decision making in the program due to the viable partnership developed between them and school.					
	1.6. Financial Concerns					
1	The School receives fund from the program.					
2	There is a clear provision as to how the fund would be allocated.					
3	The amount of fund received is sufficient for					



Philippine Normal University

The National Center for Teacher Education

	the implementation of the program.					
12	The funds are allocated based on the priority and need of the teachers and students in the program.					
	1.7.Support System					
1	The school provides counseling to the teachers, students, and parents in the program.					
17	Has library and research center which would help the students in their researches.					
	1.8.Tracking of Students					
2	The guidance office and principal office examine the factors affecting the attendance and performance of students in the program.					
8	An assessment test is administered to track the level of learning of the students.					
	1.9. Monitoring and Evaluation					
2	There is a committee tasks to assess the implementation of the program.					
4	The program is evaluated by experts to arrive in decisions which will help improve the effectiveness of the program.					
9	The implementation of the program improves after evaluation					
10	The results of evaluation reflects the strengths and weaknesses in the implementation of the program					



Philippine Normal University

The National Center for Teacher Education

Appendix C

QUANTITATIVE RESULTS OF VALIDATION

	VALIDATORS												
	1	2	3	4	5	6	7	8	9	10	Sum	Mean	Interpretation
1. 1. MANAGEMENT													
1.1.1Planning													
1	3	3	3	4	3	4	4	3	4	3	34	3.40	Very Acceptable
2	3	3	4	4	3	4	4	3	1	4	33	3.30	Very Acceptable
3	3	3	3	3	3	4	4	3	4	3	33	3.30	Very Acceptable
4	3	3	4	4	3	4	4	3	4	4	36	3.60	Very Acceptable
5	3	3	4	4	3	3	4	3	4	4	35	3.50	Very Acceptable
6	3	3	4	4	3	3	4	3	4	4	35	3.50	Very Acceptable
7	3	3	4	4	3	3	4	3	4	4	35	3.50	Very Acceptable
8	3	3	4	3	3	3	4	3	1	4	31	3.10	Acceptable
9	3	3	4	4	3	4	4	3	3	4	35	3.50	Very Acceptable
10	3	3	4	4	4	4	4	3	1	4	34	3.40	Very Acceptable
1.1.2. Organizing													
1	3	3	4	4	4	4	4	3	1	4	34	3.40	Very Acceptable
2	3	3	3	4	4	4	4	3	4	4	36	3.60	Very Acceptable
3	3	3	3	4	4	4	4	3	4	4	36	3.60	Very Acceptable
4	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
5	3	3	3	4	4	4	4	3	4	4	36	3.60	Very Acceptable
6	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
7	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
8	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
9	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
10	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
1.1.3. Leading													
1	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
2	3	2	4	4	4	4	3	3	4	4	35	3.50	Very Acceptable
3	3	2	4	3	4	4	3	3	4	4	34	3.40	Very Acceptable
4	3	2	4	4	4	4	4	3	1	4	33	3.30	Very Acceptable
5	3	3	4	4	4	4	3	3	4	4	36	3.60	Very Acceptable
6	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
7	3	3	4	3	4	4	4	3	4	4	36	3.60	Very Acceptable
8	3	3	4	3	4	4	4	3	4	4	36	3.60	Very Acceptable



Philippine Normal University

The National Center for Teacher Education

9	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
10	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
1.1.4. Controlling													
1	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
2	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
3	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
4	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
5	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
6	3	3	4	4	4	4	4	3	2	4	35	3.50	Very Acceptable
7	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
8	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
9	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
10	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
1.2. LEADERSHIP													
1	3	3	3	3	4	4	4	3	4	3	34	3.40	Very Acceptable
2	3	3	3	3	4	4	4	3	4	3	34	3.40	Very Acceptable
3	3	3	3	3	1	4	4	3	4	3	31	3.10	Acceptable
4	3	3	3	3	4	4	4	3	4	3	34	3.40	Very Acceptable
5	3	3	3	3	4	4	4	3	4	3	34	3.40	Very Acceptable
6	3	3	3	3	4	4	4	3	4	3	34	3.40	Very Acceptable
7	3	3	3	3	4	4	4	3	4	3	34	3.40	Very Acceptable
8	3	3	3	3	4	4	4	3	3	3	33	3.30	Very Acceptable
9	3	3	3	3	4	4	4	3	4	3	34	3.40	Very Acceptable
10	3	3	3	3	4	4	4	3	4	3	34	3.40	Very Acceptable
11	3	2	3	3	4	4	4	3	4	3	33	3.30	Very Acceptable
12	3	4	3	3	4	4	4	3	4	3	35	3.50	Very Acceptable
13	3	4	3	3	4	4	4	3	1	1	30	3.00	Acceptable
14	3	3	3	3	4	4	4	3	4	3	34	3.40	Very Acceptable
15	3	3	3	3	4	4	4	1	1	3	29	2.90	Acceptable
16	3	3	3	3	4	4	4	3	1	3	31	3.10	Acceptable
17	3	3	3	3	4	4	4	3	2	3	32	3.20	Acceptable
18	3	3	3	3	4	4	4	3	4	3	34	3.40	Very Acceptable
19	3	3	3	3	4	4	4	3	4	4	35	3.50	Very Acceptable
20	3	3	3	3	4	4	4	3	4	4	35	3.50	Very Acceptable
21	3	3	3	3	4	4	4	3	4	4	35	3.50	Very Acceptable
22	3	3	3	3	4	4	4	3	4	4	35	3.50	Very Acceptable
23	3	3	3	3	4	4	4	3	4	4	35	3.50	Very Acceptable
24	3	3	3	3	1	4	4	3	4	1	29	2.90	Acceptable



Philippine Normal University

The National Center for Teacher Education

25	3	3	3	3	4	4	4	3	4	4	35	3.50	Very Acceptable
26	3	3	3	3	4	4	4	3	4	4	35	3.50	Very Acceptable
27	3	3	3	3	4	4	4	3	4	4	35	3.50	Very Acceptable

1.2. CURRICULUM MANAGEMENT														
1	4	3	3	3	4	3	4	3	3	4	34	3.40	Very Acceptable	
2	4	3	3	3	4	3	4	3	3	4	34	3.40	Very Acceptable	
3	4	3	3	3	4	3	3	3	3	3	32	3.20	Very Acceptable	
4	4	3	3	3	4	3	3	3	4	4	34	3.40	Very Acceptable	
5	3	3	3	3	3	3	3	3	3	4	31	3.10	Acceptable	
6	4	3	3	3	3	3	3	3	4	4	33	3.30	Very Acceptable	
7	3	3	3	3	3	4	3	3	4	4	33	3.30	Very Acceptable	
8	4	3	3	3	3	4	3	3	3	4	33	3.30	Very Acceptable	
9	4	3	3	3	4	4	3	3	4	4	35	3.50	Very Acceptable	
10	4	3	3	3	3	4	3	3	4	4	34	3.40	Very Acceptable	
11	4	3	3	3	4	4	3	3	4	4	35	3.50	Very Acceptable	
12	2	3	3	3	3	4	3	3	4	4	32	3.20	Acceptable	
13	4	3	3	3	4	4	4	3	4	4	36	3.60	Very Acceptable	
14	4	3	3	3	4	4	4	3	4	4	36	3.60	Very Acceptable	
15	4	3	3	3	4	4	4	3	4	4	36	3.60	Very Acceptable	
16	4	3	3	3	4	4	4	3	4	4	36	3.60	Very Acceptable	

1.3. STUDENTS ACHIEVEMENT													
1	3	3	4	4	3	4	4	3	4	4	36	3.60	Very Acceptable
2	3	3	4	4	3	4	4	3	2	4	34	3.40	Very Acceptable
3	3	3	4	3	3	4	3	3	4	3	33	3.30	Very Acceptable
4	3	3	4	4	3	4	4	3	4	4	36	3.60	Very Acceptable
5	3	3	4	4	4	4	3	3	3	4	35	3.50	Very Acceptable
6	3	3	2	4	4	4	4	3	4	4	35	3.50	Very Acceptable
7	3	3	4	4	3	4	4	4	4	4	37	3.70	Very Acceptable
8	3	3	4	4	4	4	4	4	4	4	38	3.80	Very Acceptable
9	3	3	4	4	4	4	4	3	4	2	35	3.50	Very Acceptable
10	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable



Philippine Normal University

The National Center for Teacher Education

1.4. PROFESSIONAL DEVELOPMENT													
1	3	2	4	3	4	4	4	3	4	4	35	3.50	Very Acceptable
2	3	3	4	3	4	4	4	3	4	4	36	3.60	Very Acceptable
3	3	3	4	3	4	4	4	3	1	4	33	3.30	Very Acceptable
4	3	3	4	3	4	4	4	3	4	4	36	3.60	Very Acceptable
5	3	4	4	3	4	4	4	3	4	4	37	3.70	Very Acceptable
6	3	4	4	3	4	4	4	3	4	4	37	3.70	Very Acceptable
7	3	3	4	3	4	4	4	3	2	4	34	3.40	Very Acceptable
8	3	4	4	3	3	4	4	3	4	4	36	3.60	Very Acceptable
9	3	4	4	3	4	4	4	1	4	4	35	3.50	Very Acceptable
10	3	4	4	4	4	4	4	1	4	4	36	3.60	Very Acceptable
11	3	4	4	4	4	4	4	3	4	4	38	3.80	Very Acceptable

1.5. PARTNERSHIP BUILDING													
1	4	4	3	3	4	3	3	3	4	4	35	3.50	Very Acceptable
2	4	4	3	3	4	4	4	3	2	2	33	3.30	Very Acceptable
3	4	4	3	3	4	4	3	3	3	4	35	3.50	Very Acceptable
4	4	4	3	3	4	2	4	3	4	4	35	3.50	Very Acceptable
5	4	4	4	3	4	4	4	3	4	4	38	3.80	Very Acceptable
6	4	4	3	3	4	2	4	3	2	2	31	3.10	Acceptable
7	4	4	3	2	4	2	4	3	2	4	32	3.20	Acceptable
8	4	4	3	2	4	4	3	3	4	4	35	3.50	Very Acceptable
9	4	4	3	3	4	4	4	3	3	4	36	3.60	Very Acceptable
10	4	4	3	3	4	4	4	3	4	3	36	3.60	Very Acceptable

1.6. FINANCIAL CONCERNS														
1	3	3	4	3	1	4	4	3	4	4	33	3.30	Very Acceptable	
2	3	3	4	3	4	4	4	3	4	4	36	3.60	Very Acceptable	
3	3	3	4	3	4	2	4	3	4	4	34	3.40	Very Acceptable	
4	3	3	4	3	4	4	4	3	4	4	36	3.60	Very Acceptable	
5	3	3	4	3	4	4	4	3	4	4	36	3.60	Very Acceptable	
6	3	3	4	3	4	2	3	3	1	3	29	2.90	Very Acceptable	
7	2	2	4	2	4	4	4	2	4	4	32	3.20	Acceptable	
8	3	3	4	3	4	4	4	3	4	4	36	3.60	Very Acceptable	
9	3	3	4	3	4	2	4	3	4	4	34	3.40	Very Acceptable	
10	3	3	4	3	4	4	3	3	4	4	35	3.50	Very Acceptable	
11	3	3	4	3	4	4	4	3	2	3	33	3.30	Very Acceptable	



Philippine Normal University

The National Center for Teacher Education

12	3	3	4	3	4	4	4	3	4	4	36	3.60	Very Acceptable
1.7. SUPPORT SYSTEM													
1	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
2	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
3	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
4	3	3	2	4	4	4	4	3	4	4	35	3.50	Very Acceptable
5	3	3	4	3	4	4	4	3	4	4	36	3.60	Very Acceptable
6	3	3	4	4	4	4	4	3	1	4	34	3.40	Very Acceptable
7	3	3	4	4	3	4	4	3	4	4	36	3.60	Very Acceptable
8	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
9	3	2	4	4	3	4	4	1	4	4	33	3.30	Very Acceptable
10	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
11	3	3	2	4	4	4	4	3	4	4	35	3.50	Very Acceptable
12	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
13	3	2	4	1	1	4	4	1	1	4	25	2.50	Acceptable
14	1	1	4	4	4	4	4	1	4	4	31	3.10	Acceptable
15	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable
16	3	1	4	4	4	4	4	1	4	4	33	3.30	Very Acceptable
17	3	3	4	4	4	4	4	3	4	4	37	3.70	Very Acceptable

1.8. TRACKING OF STUDENTS													
1	3	2	4	4	3	4	4	3	4	4	35	3.50	Very Acceptable
2	3	3	4	4	3	3	4	3	4	4	35	3.50	Very Acceptable
3	3	3	4	3	3	4	4	3	3	4	34	3.40	Very Acceptable
4	3	2	4	4	3	4	4	3	4	4	35	3.50	Very Acceptable
5	3	3	4	4	3	4	4	3	4	4	36	3.60	Very Acceptable
6	3	4	4	2	3	2	4	3	4	3	32	3.20	Acceptable
7	3	3	4	4	3	4	3	3	4	4	35	3.50	Very Acceptable
8	3	2	4	4	3	4	4	3	4	4	35	3.50	Very Acceptable
9	3	3	4	4	3	3	4	3	3	2	32	3.20	Acceptable
10	3	3	4	4	3	4	3	3	3	2	32	3.20	Acceptable
11	3	3	4	4	3	4	4	3	3	2	33	3.30	Very Acceptable



Philippine Normal University

The National Center for Teacher Education

1.9. MONITORING AND EVALUATION													
1	3	3	4	4	3	3	4	3	3	4	34	3.40	Very Acceptable
2	3	3	4	4	3	4	4	3	3	4	35	3.50	Very Acceptable
3	3	3	4	4	3	3	4	3	3	2	32	3.20	Acceptable
4	3	3	4	4	3	4	4	3	3	4	35	3.50	Very Acceptable
5	3	3	4	4	3	4	4	3	3	3	34	3.40	Very Acceptable
6	3	3	4	4	3	4	4	3	4	4	36	3.60	Very Acceptable
7	3	3	4	4	3	4	4	3	4	2	34	3.40	Very Acceptable
8	3	3	4	4	3	3	4	3	3	4	34	3.40	Very Acceptable
9	3	3	4	4	3	4	4	3	3	2	33	3.30	Very Acceptable
10	3	3	4	4	3	4	4	3	3	4	35	3.50	Very Acceptable



Philippine Normal University
The National Center for Teacher Education

Appendix D

**SUMMARY OF EXPERTS' VALIDATION
(Portion Only)**

	Original Item	Revised Item/ Comments
#	1.1. Management and Leadership	
1.1. 1.	Planning	Arrange in logical sequence
3	Explains the objectives and expectations of the program.	Separate words that have different concepts. Explains the (a) objectives of the program. Explains the (b) expectations of the program.
5	Sets clear plans and directions for the program.	Sets (a) clear plans for the program. Sets (b) directions for the program.
1.1. 2	Organizing	
2.	Has a clear structure and organization which defines the responsibilities of school head, teachers, parents, and students.	Has a clear structure and organization which defines the functions and responsibilities of school head, teachers, parents, and students.
6.	Sets clear rules and guidelines in adapting instructional materials.	Sets clear (a) rules in adapting instructional materials. Sets clear (b) guidelines in adapting instructional materials.
1.1. 3	Leading	
1	Communicates the actualities in the implementation of program with teachers, students, and parents.	Communicates with teachers, students, and parents the actualities on the implementation of the program
3	Encourages teachers, students, and parents to give suggestions and feedback in the implementation of program.	Encourages teachers, students, parents and industry sector to give suggestions and feedback in the implementation of program
8	Empowers and leads teachers in accomplishing activities according to the expectations of the program.	(a) Empowers teachers in accomplishing activities according to the expectations of the program.



Philippine Normal University

The National Center for Teacher Education

		(b) Leads teachers in accomplishing activities according to the expectations of the program.
9	Demonstrates leadership skills for the effective and efficient academic performance and learning environment.	Demonstrate leadership skills in the achievement of the programs goals and objectives.
1.1.4	Controlling	
1	Monitors and assesses the performance of teachers and students.	(a) Monitors the performance of teachers and students. (b) Assesses the performance of teachers and students.
6	Ensures that instructional materials and equipment to support the learning of students are properly used and maximized.	Ensures proper use and maximization of instructional materials and equipment that support students' learning.
	1.1.2. Leadership	
2	Conducts conferences with the teachers to get feedbacks in the implementation of the program.	Consults with the teachers to get feedback in the implementation of the program
3	Sets targets for the improvement of the program.	Delete- Redundant
11	Promotes positive school culture.	
12	Participates and involves the teachers, students, and parents in making decision for the program.	Omit participates
13	Consults teachers, students, and parents before making decisions for the program.	Omit this indicator
14	Solicits inputs from teachers, students, and teachers for the improvement of the program.	Solicits feedback from stakeholders for the improvement of the program
15	Encourages collaborative efforts among teachers	Delete- Collapse with item 9
	1.2. Curriculum	
2	The teachers have formal training to teach the subjects in the curriculum.	The teachers have enough training on the proper implementation of the curriculum.
3	The students are provided with activities which will equip them in developing skills expected in the program.	The students are provided with activities that will harness their skills expected of them in the program.
14	The teachers are able to deliver the subject matter with ease and confidence.	The teachers are able to explain the subject content with confidence.



Philippine Normal University

The National Center for Teacher Education

15	The teachers present the lesson accordingly with the approaches embedded in the curriculum.	The teachers present the lesson according to the varied approaches embedded in the curriculum.
16	Research skills of students are emphasized in their learning.	Research skills of students are emphasized in their activities.
	1.3. Students' Achievement	
4	Teachers Implements activities that reinforce the learning of students.	Teachers implement activities that reinforce the learning of students.
5	Performs periodic assessment that measures the achievement students.	Teachers perform outcome- based of assessment that measures the achievement of students.
8	The results of the assessment are used to plans for the improvement of students' achievement.	The results of the assessment are used to formulate plans for the improvement of students' achievement.
	1.4. Professional Development	
2	The school has clear school-based professional development plan for the teachers.	The school <i>promotes</i> the school-based professional development plan for the teachers.
5	The teachers involved in the program availed scholarship programs to enhance and capacitate them in the program.	The teachers involved in the program availed of the scholarship program offered to them.
7	The teachers are sent in the research seminar which capacitates their research skill so that they will be able to offer solutions in the problems confronting the implementation of the program.	The teachers are sent to research seminars which capacitate their research skills particularly in offering solutions to problems confronting the implementation of the program.
10	The schools provide and give opportunity to the teachers for their professional development.	Provides opportunity to the teachers in their professional development
	1.5. Partnership Building	
3	The school provides an instructional program where students can perform their learning through community based learning.	The school provides an instructional program where students be provided with experiences through community- based learning.
4	The school offers partnership development program with the parents so that there is continuity of learning even outside the school.	The school offers partnership development program with the parents to facilitate continuity in learning even outside the school premises.
5	The school has partnership development plan for parents, community and business	The school establishes strong partnership with the stakeholders and



Philippine Normal University

The National Center for Teacher Education

		business enterprise.
7	The performance of students improved resulted from the partnership development plan initiated by the school	The improved performance of students was a result of the partnership development plan initiated by the school.
	1.6. Financial Concerns	
1	There is a budget proposal presented to the teachers, students, and parents.	The budget proposal and approved budget are presented to the teachers, students, and parents.
8	The teachers, parents, and students are aware on the proper utilization of fund of the program.	Transparency in the financial activities of the school is sustained.
10	The funds allocated to the school are properly utilized in support to the implementation of the program.	Delete- redundant
	1.7. Support System	
7	The school has provisions in supporting the financial needs and allowances of the students in the program.	Delete this item, the same as #14
12	There is an after school program design for the students to help understand their lessons.	There is an enrichment program initiated by school which help the students to understand their lessons.
	1.8. Tracking of Students	
2	The guidance office and principal office examine the factors affecting the attendance and performance of students in the program.	The guidance office conducts researches relative to the performance of students in the program.
3	The school traces students in the courses they are taking in college.	Delete- the same as item # 7
5	The school gives recognition to the students who manifest outstanding performance in the program.	Transfer as #11 in 1.3 (Students Achievement)
	1.9. Monitoring and Evaluation	
1	There is an assessment activities held regularly to monitor the implementation of the program.	There is a periodic assessment to monitor the implementation of the program.
6	The data obtained after evaluation are presented to the teachers, students, and parents to identify next actions to be taken for the program.	The data obtained after evaluation are presented to the teachers, students, and parents to identify succeeding actions to be taken for the program.



Philippine Normal University
The National Center for Teacher Education

Appendix E

**LETTER TO THE REGIONAL DIRECTOR
FOR THE PERMISSION TO CONDUCT THE SURVEY**

PHILIPPINE NORMAL UNIVERSITY
The National Center for Teacher Education



November 9, 2013

DIOSDADO M. SAN ANTONIO
Director III
Office of the Regional Director
Region IV- A CALABARZON

Sir,

Greetings!

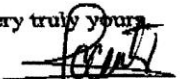
I, the undersigned, is a Ph. D candidate at the Philippine Normal University Manila and am conducting research entitled "Development of Management Framework to Enhance the Science, Technology and Engineering Program (STEP) in CALABARZON region" in partial fulfillment of the requirements for the degree, Doctor of Philosophy in Education major in Educational Management.

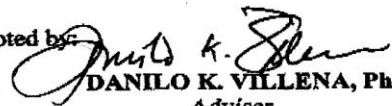
In this connection, I am seeking permission and endorsement from your good office to allow me to conduct the study in the five original public secondary schools offering the special science program in this region. It is also proposed to get the views of the school heads, Science and Mathematics teachers, and the graduating students about the status of implementation of the special science program in their school.

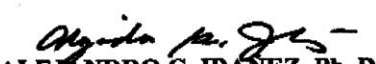
Considering that this study supports the thrust towards effective and efficient implementation of educational programs hence, it is hoped that this will merit your favorable and official action.

Thank you for consideration and approval.

Very truly yours,


ADRIAN C. GUINTO
Ph. D. Student

Noted by: 
DANILO K. VILLENA, Ph. D.
Adviser


ALEJANDRO G. IBANEZ, Ph. D.
Co- Adviser

Approved:


DIOSDADO M. SAN ANTONIO
Director III
Office of the Regional Director
Region IV- A CALABARZON



Philippine Normal University
The National Center for Teacher Education

Appendix F

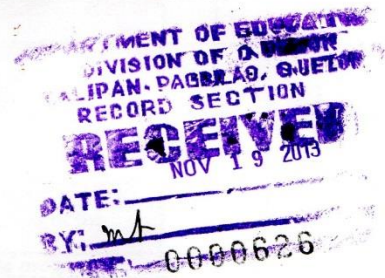
LETTER ADDRESSED TO THE SCHOOLS DIVISION SUPERINTENDENT

SPS

PHILIPPINE NORMAL UNIVERSITY
The National Center for Teacher Education

November 19, 2013

TOLENTINO G. AQUINO
School Division Superintendent
Division of Quezon



Sir/ Madam;

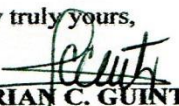
Greetings!

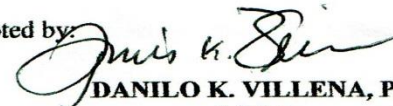
I, the undersigned, is currently working for the completion of my dissertation at the Philippine Normal University Manila, entitled "Development of Management Framework to Enhance the Science, Technology, and Engineering Program (STEP) in implementing school in CALABARZON region" in partial fulfillment of the requirements for the degree, Doctor of Philosophy in Education major in Educational Management.

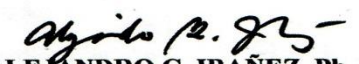
In this connection, I am seeking permission and endorsement from your good office to please allow me administer the attached questionnaire and conduct interview to school head, selected science and mathematics teachers, and students in the secondary school offering the special science program. Rest assured that the data which will be collected will be treated with utmost confidentiality.

Thank you for consideration and approval.

Very truly yours,


ADRIAN C. GUINTO
Ph. D. Student

Noted by: 
DANILO K. VILLENA, Ph. D.
Adviser


ALEJANDRO G. IBAÑEZ, Ph. D.
Co- Adviser



Philippine Normal University
The National Center for Teacher Education

Appendix G

PROFILE OF CONTENT VALIDATORS

#	Validators	Present Designation	Office/ Station
1	Dir. DIOSDADO M. SAN ANTONIO	Regional Director, Region IV- A CALABARZON	Office of the Regional Director, DepEd Region IV- A CALABARZON
2	Dr. CRISTETO A. PAMPLONA	Schools Division Superintendent	DepEd- Division of Lipa City, Region IV- A CALABARZON
3	Dr. JOY TALENS	College Faculty Research Coordinator	De la Salle Lipa Region IV-A CALABARZON
4	JOSILYN S. SOLANA, CESO V	Schools Division Superintendent	DepEd- Division of Tanauan City, Region IV- A CALABARZON
5	Dr. ALICE B. BOTARDO	Vice- Chancellor for Academics and Research	Dela Salle University- Lipa City Batangas
6	Dr. NILO E. COLINARES	Professor- Graduate Studies OIC- AACUP	Philippine Normal University Manila
7	Dr. ERLINDA V. NAVARRO	Professor Graduate Studies	Philippine Normal University Manila
8	Dr. RODERICK TADEO	Professor Graduate Studies	Philippine Normal University
9	Fr. FERDIE BAUTISTA	Professor Graduate Studies	Philippine Normal University
10	Dr. GABRIEL URIARTE	Professor Graduate Studies	Philippine Normal University



Philippine Normal University
The National Center for Teacher Education

Appendix H

CERTIFICATION OF EDITING

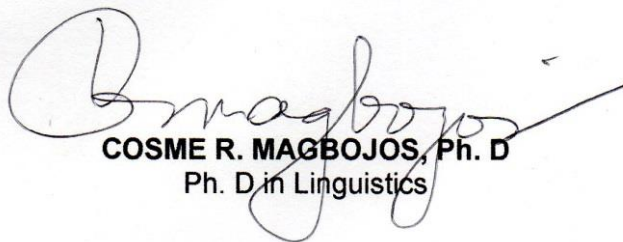
January 23, 2014

CERTIFICATION

To whom it may concern:

This is to certify that I, Dr. COSME R. MAGBOJOS, graduated with a degree in Ph. D in Linguistics from the Philippine Normal University- Manila, edited the dissertation of Adrian C. Guinto entitled "Development of a Management Framework to Enhance the Science, Technology, and Engineering (STE) Program Implementing Schools in CALABARZON Region".

This certification is issued upon the request of Mr. Guinto for whatever purpose it may serve him best.


COSME R. MAGBOJOS, Ph. D
Ph. D in Linguistics



Philippine Normal University
The National Center for Teacher Education

Appendix I

CERTIFICATION OF AUTHENTICITY TEST



Philippine Normal University
The National Center for Teacher Education
EDUCATIONAL POLICY RESEARCH AND DEVELOPMENT CENTER (EPRDC)
Email: eprdc@pnu.edu.ph Tel/Fax: (02) 527-0366

C E R T I F I C A T I O N

This is to certify that the dissertation of ADRIAN C. GUINTO entitled "*Development of a Management Framework to Enhance the Science, Technology, and Engineering (STE) Program Implementing Schools in CALABARZON Region*" **passed** the authenticity test performed by the Center on January 21, 2014, using the Anti-Plagiarism software of the university.


WILMA S. REYES, Ph.D.
Director

PNU OR No: 132197
UCRSS CN: 2014-008
Student No: 6260912684



Philippine Normal University
The National Center for Teacher Education

Appendix J

**INDORSMENT LETTER FROM THE OFFICE OF THE
SCHOOLS DIVISION SUPERINTENDENT**

 Republic of the Philippines
DEPARTMENT OF EDUCATION
Region IV-A CALABARZON
DIVISION OF QUEZON
Talipan, Pagbilao, Quezon

RELEASED
DATE: DEC 06 2013

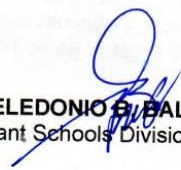
1st Endorsement
December 6, 2013

Respectfully returned to Mr. **ADRIAN C. GUINTO**, Ph. D Student, Philippine Normal University, Manila, approved permit to distribute questionnaires and conduct interview among the Principals, Science and Math Teachers and Students in the Secondary Schools offering Special Science Program in the Division of Quezon, provided that classes will not be disrupted and the Schools Division Office be furnished a final copy of the action research conducted.

For:

TOLENTINO G. AQUINO, CESO VI
Schools Division Superintendent

By:


CELEDONIO S. BALDERAS, JR.
Assistant Schools Division Superintendent



Philippine Normal University
The National Center for Teacher Education

Appendix K

TEST OF INTERNAL CONSISTENCY

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.877	.880	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PLQ1	31.7937	21.586	.437	.305	.878
PLQ2	31.5397	21.381	.514	.467	.872
PLQ3	31.1746	21.921	.503	.393	.872
PLQ4	31.4444	21.670	.552	.551	.869
PLQ5	31.5079	21.351	.529	.620	.870
PLQ6	31.4444	20.638	.715	.728	.858
PLQ7	31.5556	20.444	.711	.626	.858
PLQ8	31.7302	21.232	.640	.567	.864
PLQ9	31.8095	20.415	.687	.710	.860
PLQ10	31.8095	20.737	.605	.563	.865
PLQ11	31.6508	20.457	.588	.508	.867



Philippine Normal University

The National Center for Teacher Education

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.810	.812	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
OR1	26.7143	17.369	.232	.426	.817
OR2	26.9524	15.014	.579	.516	.783
OR3	27.1905	14.415	.658	.592	.773
OR4	27.4603	14.865	.462	.390	.799
OR5	27.0635	14.577	.596	.659	.780
OR6	27.0635	14.706	.535	.514	.788
OR7	26.9524	16.046	.465	.466	.796
OR8	27.1111	16.133	.519	.454	.792
OR9	27.0317	16.451	.495	.509	.795
OR10	27.1746	16.050	.379	.444	.806

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.866	.871	11



Philippine Normal University

The National Center for Teacher Education

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LQ1	31.3651	20.010	.608	.525	.851
LQ2	31.3968	20.953	.566	.372	.854
LQ3	31.3651	20.236	.593	.720	.852
LQ4	31.3968	21.566	.302	.627	.876
LQ5	31.3810	20.207	.584	.554	.852
LQ6	31.2381	20.733	.538	.451	.856
LQ7	31.2698	20.491	.624	.485	.850
LQ8	31.2381	20.088	.714	.641	.844
LQ9	31.3492	20.328	.592	.528	.852
LQ10	31.2063	21.005	.584	.615	.853
LQ11	31.3968	20.501	.568	.475	.854

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.922	.922	24



Philippine Normal University
The National Center for Teacher Education

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LEQ1	69.8413	102.103	.562	.	.919
LEQ2	69.9841	103.564	.580	.	.919
LEQ3	70.1111	101.358	.487	.	.920
LEQ4	70.2698	101.071	.554	.	.919
LEQ5	70.1270	98.790	.597	.	.918
LEQ6	70.1429	99.899	.635	.	.917
LEQ7	69.8413	101.426	.591	.	.918
LEQ8	70.0159	100.371	.693	.	.917
LEQ9	70.0000	101.323	.586	.	.918
LEQ10	69.9524	101.498	.550	.	.919
LEQ11	70.0794	101.719	.525	.	.919
LEQ12	70.3333	100.194	.594	.	.918
LEQ13	70.2857	100.788	.535	.	.919
LEQ14	70.0476	99.724	.688	.	.917
LEQ15	70.1746	103.275	.473	.	.920
LEQ16	69.9524	104.659	.356	.	.922
LEQ17	69.8095	102.447	.525	.	.919
LEQ18	69.7302	106.265	.281	.	.923
LEQ19	69.8413	102.749	.416	.	.922
LEQ20	69.9206	100.365	.596	.	.918
LEQ21	70.0159	101.177	.547	.	.919
LEQ22	70.0794	100.784	.611	.	.918
LEQ23	70.0476	99.046	.652	.	.917
LEQ24	70.2222	100.563	.630	.	.918

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.912	.915	18



Philippine Normal University

The National Center for Teacher Education

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
CUQ1	54.1111	62.294	.364	.515	.914
CUQ2	54.1905	64.447	.313	.625	.913
CUQ3	54.1429	59.995	.646	.732	.905
CUQ4	54.1746	60.469	.695	.674	.904
CUQ5	54.0794	61.042	.608	.673	.907
CUQ6	54.3651	59.494	.589	.658	.907
CUQ7	54.5238	59.995	.503	.555	.910
CUQ8	54.0635	60.770	.628	.682	.906
CUQ9	54.0159	60.822	.718	.660	.904
CUQ10	54.0794	61.784	.612	.626	.907
CUQ11	53.9841	61.113	.567	.684	.908
CUQ12	53.8095	62.350	.558	.614	.908
CUQ13	53.9841	63.306	.395	.590	.912
CUQ14	53.9206	60.590	.649	.651	.905
CUQ15	54.0000	60.484	.657	.674	.905
CUQ16	54.0000	59.484	.659	.699	.905
CUQ17	54.1587	59.265	.677	.704	.904
CUQ18	54.2540	58.386	.668	.733	.905

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.877	.878	12



Philippine Normal University

The National Center for Teacher Education

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SAQ1	34.8730	24.403	.752	.728	.856
SAQ2	35.1270	26.500	.586	.578	.867
SAQ3	34.9365	26.222	.541	.634	.869
SAQ4	34.9524	25.530	.606	.740	.865
SAQ5	35.0794	24.977	.632	.720	.863
SAQ6	34.8889	25.358	.662	.658	.862
SAQ7	35.0000	24.839	.614	.635	.864
SAQ8	35.2381	27.700	.337	.421	.879
SAQ9	35.0952	25.088	.545	.553	.869
SAQ10	35.1587	26.297	.428	.421	.876
SAQ11	34.8889	25.842	.559	.793	.868
SAQ12	34.8571	25.382	.597	.797	.866

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.914	.917	12



Philippine Normal University

The National Center for Teacher Education

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PRQ1	34.7302	34.265	.637	.595	.908
PRQ2	34.8095	35.963	.562	.620	.911
PRQ3	35.0159	35.145	.576	.532	.911
PRQ4	34.9365	35.867	.657	.524	.908
PRQ5	34.7143	34.691	.696	.632	.906
PRQ6	34.9206	34.332	.620	.545	.909
PRQ7	34.8413	32.426	.729	.707	.904
PRQ8	34.8095	34.221	.741	.625	.904
PRQ9	35.0000	34.677	.566	.545	.912
PRQ10	34.8413	34.523	.717	.693	.905
PRQ11	34.8095	34.544	.699	.641	.905
PRQ12	34.9206	34.332	.709	.687	.905

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.892	.894	10



Philippine Normal University

The National Center for Teacher Education

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PBQ1	24.4921	35.383	.554	.487	.888
PBQ2	24.6190	35.143	.628	.613	.882
PBQ3	24.3333	34.839	.701	.652	.877
PBQ4	24.2063	35.392	.724	.662	.877
PBQ5	24.2698	36.458	.549	.638	.887
PBQ6	24.3016	36.150	.588	.687	.885
PBQ7	24.2222	36.079	.587	.660	.885
PBQ8	24.5556	33.380	.664	.684	.880
PBQ9	24.3492	33.586	.728	.721	.875
PBQ10	24.2222	35.498	.632	.584	.882

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.950	.952	11



Philippine Normal University

The National Center for Teacher Education

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
FCQ1	21.8571	75.157	.673	.620	.949
FCQ2	22.0794	73.171	.753	.716	.947
FCQ3	21.4444	78.541	.443	.431	.959
FCQ4	22.1587	72.652	.879	.849	.942
FCQ5	22.0476	74.498	.793	.759	.945
FCQ6	22.1587	73.071	.837	.783	.943
FCQ7	22.2222	73.434	.815	.829	.944
FCQ8	22.0635	72.996	.880	.850	.942
FCQ9	21.9683	73.031	.848	.858	.943
FCQ10	21.9206	72.752	.869	.840	.942
FCQ11	21.9841	72.887	.805	.740	.944

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.928	.928	17



Philippine Normal University
The National Center for Teacher Education

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SSQ1	40.6825	107.962	.491	.539	.927
SSQ2	40.9206	108.784	.482	.599	.927
SSQ3	41.2222	104.079	.611	.695	.925
SSQ4	41.2540	101.515	.687	.679	.923
SSQ5	41.2857	101.111	.723	.770	.922
SSQ6	41.0635	102.931	.672	.787	.923
SSQ7	40.9206	100.623	.743	.739	.921
SSQ8	40.8571	105.963	.606	.608	.925
SSQ9	41.0635	100.996	.783	.689	.920
SSQ10	41.2857	99.304	.779	.751	.920
SSQ11	41.0635	103.577	.636	.649	.924
SSQ12	40.9841	103.242	.684	.688	.923
SSQ13	41.5873	101.633	.607	.579	.925
SSQ14	41.2857	105.659	.513	.648	.927
SSQ15	41.6508	104.489	.541	.576	.927
SSQ16	41.2222	102.563	.608	.544	.925
SSQ17	41.0794	104.816	.590	.579	.925

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.859	.858	8



Philippine Normal University
The National Center for Teacher Education

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
TQ1	20.5397	15.156	.588	.475	.844
TQ2	20.6190	14.304	.676	.567	.834
TQ3	20.6190	14.594	.643	.563	.838
TQ4	20.5397	16.543	.342	.392	.869
TQ5	20.4444	14.961	.587	.506	.845
TQ6	20.6190	14.240	.713	.626	.830
TQ7	20.5079	14.189	.683	.527	.833
TQ8	20.8889	14.487	.603	.463	.843

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.918	.919	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
MEQ1	31.2857	36.756	.554	.646	.916
MEQ2	31.5079	35.415	.693	.747	.910
MEQ3	31.3333	35.774	.755	.667	.909
MEQ4	31.6032	36.405	.587	.642	.915
MEQ5	31.4286	35.926	.641	.543	.913
MEQ6	31.4286	35.765	.687	.508	.911
MEQ7	31.3333	36.161	.558	.609	.916
MEQ8	31.4286	36.636	.626	.489	.913
MEQ9	31.4762	34.705	.770	.664	.907
MEQ10	31.4286	34.055	.713	.775	.910
MEQ11	31.3810	34.756	.695	.690	.910
MEQ12	31.3333	34.355	.725	.711	.909



Philippine Normal University
The National Center for Teacher Education



CURRICULUM VITAE

ADRIAN CALDERON GUINTO

Brgy. Trapiche I, Tanauan City,
Batangas

SCHOLASTIC RECORD

Doctor of Philosophy (Ph. D.)
Major in Educational Management
Philippine Normal University
Taft Ave, Manila

June 2009- March 2014

Certificate in Teaching Program
Major in Biology
Philippine Normal University
Taft Ave., Manila

May 2009

Master of Arts in Education
Major in Educational Administration
and Supervision
Tanauan Institute
Tanauan City, Batangas

Nov. 2005- May 2008

Bachelor of Secondary Education
Major in General Science
Camarines Norte State College
College of Education
Daet, Camarines Norte

June 1998- April 2002

Work Experience

Assistant to the Principal
Tanauan City High School
November, 2013- Present

Officer in- Charge
Tanauan City High School
Jan 2013- July, 2013



Philippine Normal University
The National Center for Teacher Education

Public secondary science teacher

Teacher III
Tanauan City High School
Tanauan City, Batangas
November 2009- Present

Award Received:

Outstanding Secondary Teacher in Science
Division of Tanauan City
Tanauan City, Batangas
2007- 2008

Scholarship Grant:

Certificate in Teaching Program in Biology
DepEd- PNU Certificate Program for
Mathematics and Science Teachers
Region IV- A CALABARZON
Term 1- November, 2007- May 2008
Term 2- March – May, 2009

Research conducted

Development of 21st century skills, critical thinking skills, and attitudes of
students using students' portfolio.
March, 2012

Impact of Active Brain Teaching Approach (ABTA) on the Academic
Performance, Attitude, and Inquiry Skill of Grade Seven Students in
Science Classroom
June, 2013

Research Conference

Oral Presenter

1st National Research Conference on K to 12 Education
Villa Caceres Hotel, Naga City
December 12- 14, 2012

Oral Presenter

1st International Research Conference on K to 12 Education
The Oriental Hotel, Legazpi City, Philippines
August 20- 22, 2013

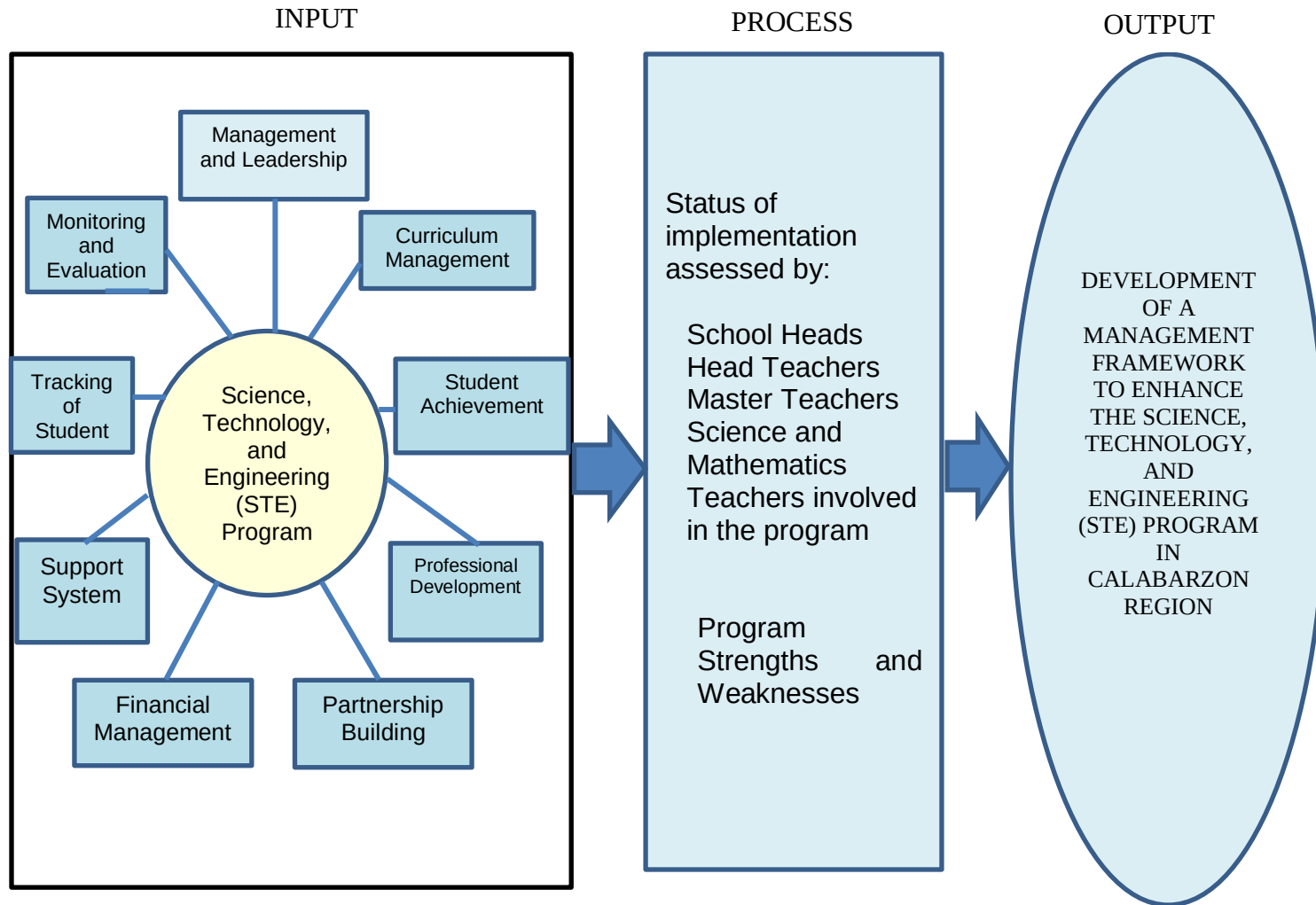


Figure 2. Research Paradigm

