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Science Teaching Efficacy, Attitude and Challenges in Doing Action

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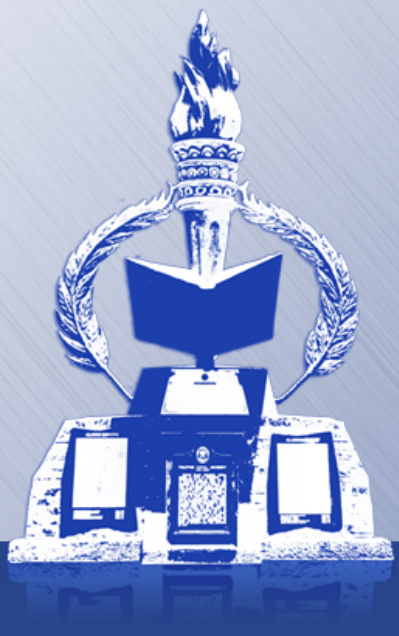

SCIENCE TEACHING EFFICACY, ATTITUDE AND CHALLENGES IN DOING ACTION RESEARCH

A Thesis Presented to the

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Master of Arts in Science Education

MYLA DELA CRUZ GERMAN

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APPROVAL SHEET

This thesis entitled "**SCIENCE TEACHING EFFICACY, ATTITUDE AND CHALLENGES IN DOING ACTION RESEARCH"** prepared and submitted by **MYLA D. GERMAN** in partial fulfillment of the requirements for the degree of Master of Arts in Science Education is hereby recommended for approval and acceptance.

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ABSTRACT

Name : Myla D. German

Title : Science Teaching Efficacy, Attitude, and Challenges in Doing Action Research

Key Concepts : Action Research, Science Teaching Efficacy, Teachers' Attitude

Degree : Master of Arts in Science Education

Adviser : Dr. Rebecca C. Nueva España

The aim of this study is to appraise science teaching efficacy, attitude, and challenges in doing action research.

A total of 60 junior high school science teachers were chosen as the respondents of this study who are teaching in the Division of Malabon for the school year 2016-2017. Three instruments were used in the study -Teacher Sense of Efficacy Scale, Science Teachers' Attitude towards Action Research, and Teachers' Challenges in Doing Action Research.

Ten (10) out of 60 junior high school science teachers were subjected to an informal interview to find out their general view, perception and other challenges teachers' encounter in doing an action research. Fifty (50) of the junior high school science teachers were the respondents of the questionnaires. Mixed method was employed in this study and the quantitative part used descriptive correlational research. The qualitative portion of this study followed thematic analysis.

Findings revealed that the level of science teachers' perceived efficacy in science teaching is positive, that there is an ease for the science teachers to handle students'

engagement and classroom management. Similarly, science teachers can deal with different instructional practices confidently. The slightly positive attitude was uncovered in science teachers in doing action research. However, the study marks that there is no correlation between teaching efficacy in science and attitude in doing action research. Science teachers' learning experiences in doing different stages of action research were noted to be not that easy. The difficulties of science teachers in doing the stages of action research revealed more on analyzing data and in developing and writing research methodology. Conversely, science teachers established a high positive perception on the value of action research in teaching and learning process.

With some of the challenges faced by science teachers, a training program can be developed for them to perform the steps by steps stages and at the same time equipped them with the technicalities of doing action research. The output of this program is an action research that can be conducted in their respective schools. Letting the science teachers understand the value of conducting action research may take a while, but it is very important that their interest and motivation are there. Seasoned teachers who did not continue or pursue graduate studies can be tapped to join the program. Another one is to organize a research team in the school in order to develop collaborative effort and also encourage science teachers to help one another in developing a valuable action research where teachers and students will gain from it.

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CHAPTER 1

THE PROBLEM AND ITS SETTING

BACKGROUND OF THE STUDY

At present, the K to 12 curriculum expected teachers to play a part in school transformation and be accountable for the success of the students. Currently, integral components of education were deemed important for the advancement of education such as the students, teachers, and instruction combined with the social aspect and economy. With a goal of enhancing the total teaching and learning process, research has been recognized to be a catalyst of the enhancement of pedagogy.

The Philippines legally mandated to conduct action research is part of the Results-based Performance and Management System (RPMS) devised by the Department of Education as operation points under corresponding key result areas. It can be merged in the Individual Performance Commitment and Review Form (IPCRF) of teachers (DO 44, s. 2015).

Issues in the society that evoked responses on people were considered as primary objectives of action research since it is an approach for methodical investigation. (Stringer, 2008). Making progress towards insightful teaching strategies, philosophical preparations and constructive variations among the elements of the learning process is the fundamental purpose of this kind of research (Mills, 2003). Action research focuses on the desire to recreate a suitable setting to those who are involved in the educational system. It is purposeful, change-oriented, participatory and collaborative in nature; thus, a reflection on one’s own practices in teaching is elicited which in turn offers a sense of empowerment and an avenue for professional development.

Action research also encourages expansion of professional opportunities and other teacher related functions on the basis of the study conducted. Hence, better self- esteem is inculcated among teachers as they are recognized to elevate the system of teaching through deeper comprehension and amplified cognizance between the reality and expected outcomes. Founded on self–examination and analysis, researches conducted by teachers provide a progressive and essential role in today's world since they observe closely in the achievable objectives and failures of students.

Educational research should be seen in a way where an individual's life takes the form of minimal steps of trial and error McNiff (as cited in Twamley 2009). The notion of trial and error recognizes and legitimizes the need for dialogue, which is about practical and real life experiences that do not fit neatly into the positivist's framework. In the positivist's world, the teacher is believed to be a historian.- Kuhn (as cited in Ganly, 2012). Observations about the child's social world are done by removing her (him) self from the situation.

The breadth of knowledge and skills in the field of teaching were provided in a new perspective by action research. With this belief, school administration and other shareholders identify this kind of study to be an enticing medium geared towards the mission and vision of the school.

This kind of research is primarily hands-on in kind (Holter & Frabutt, 2012), and suggests numerous and positive prospects for the authorities performing in the teaching profession. Therefore, it is considered a systematic process (Dinkelman n.d). Prospects brought by action research encompass the process of closing in the results of actual

teaching and research as well as extending the professional growth of teachers through empowerment.

Cochran-Smith and Lytle (2001) proposed that research is being brought into the classroom through an educator's active involvement in a methodical and objective – based analysis; hence, the teacher-researchers can initiate changes in the educational system instead of those who are outsiders to the teaching practices. It can be concluded that teacher's research will serve as a catalyst in implementing changes in the curriculum design since they receive the firsthand experience in the area of their specialization. However, innovative knowledge about the learning process has been founded on a logical and efficient demonstration of problem-solving by the teachers themselves.

In the past, teachers have been stunned with workshops and in-service training by their division that mandate utilization of best practices, but provide little assistance to teachers once they are back in their classrooms alone. Analyzing the individual needs of learners or learning to set is the task of a passionate teacher. To best meet student and system needs, teachers' actions will be organized after reflection and consideration. With student needs in mind, teachers will become oriented with the gaps in the learning process. Passion for teaching will actuate the appropriate methodology in teaching so as to make it fitting onto the learners' demands to the fullest extent.

This becomes a repetitive cycle of questions, observations, reflections and actions within and among the new and same group of learners.

In today's generation, the roles of teachers as conveyors of knowledge, facilitators and mentors are no longer adequate and teachers should move beyond these roles. That is, a teacher's role should not be restricted in delivering varied learning concepts, motivating

and inspiring learners, but should instead of being geared to act as a teacher-researcher (Suskind, 2016).

The literature revealed that teachers who have been involved in action research enjoyed collaborating and understood content standards better as a direct influence of their participation. Research also shows that the collegiality and support help teachers sustain their progressive educational beliefs, leaving them open to innovative ways of practicing and continued professional growth (Schwartz McCotter, 2001).

Acting as a classroom researcher depends on the interest and attitude of the teacher as to how the action research leads to professional efficacy. (Pajares and Schunk 2001) noted that efficacy is a content-specific construct. It defines that a person with a well-developed and self-concept overall can still have a low sense of efficacy when it comes to teaching. Efficacy is engendered in an individual through a number of different sources (Goddard, Hoy, & Woolfolk Hoy, 2004; Pajares 2002). The most concrete basis is an achievement at a given task. An educator who has experienced success with a set of learners will have an advanced sense of efficacy the undertaking. Through certain vocal influence and vicariously witnessing others flourish, efficacy can also be established. Lastly, the viewpoints an educator experience when managing to commence a duty will comprise the main influence on his or her outlook around how well the duty can be attained (Harris, 2006).

The Department of Education is mandated to conduct research and studies on a national level which can develop a part of the foundation for required reforms and strategy inputs (Chapter 1, Section 7 (5) of RA 9155) (GOVPH, 2001). The recent supervision also appreciates the necessity for evidence-based policy development by instituting reforms that

strengthen transparency and accountability among government entities. To be involved in research activities is needed among schools division as authorized by RA 9155 of the Department of Education. It means that all teaching and non-teaching personnel in the division are instructed to fully employ research in terms of doing priority improvement projects for future referrals and modifications. One of the objectives being sought in this program is for professional growth and teacher development which in turn becomes an avenue to improve students' learning outcomes. This is achieved through conducting an action research at least once every year. The thrust of every division is to strengthen the conduct of school-based, doable and output- oriented research that will improve the learning outcomes and educational system of the Division. The four priority research areas of DepEd are School Leadership and Management; Content and Pedagogy; ICT Integration; and Programs and Projects.

The intention of the current study is to assess science teachers' perceived efficacy in teaching and attitude towards action research. It seeks to find out the relationship between teaching efficacy and attitude of science teachers in doing the mandated action research. Thus, there is a necessity to investigate the different challenges science teachers encountered in doing action research.

CONCEPTUAL FRAMEWORK

In this study, the review of science teaching efficacy, attitude, and challenges in doing action research were intended for the purpose of collecting and analyzing information that will further improve student lifelong learning. Teaching efficacy and attitude towards action research were assessed first. As cited in the work of Henson (2002),

teacher's sense of efficacy is significantly predicted by the teacher's strength in achieving student scholastic accomplishment. Forecasting the feat an educator will have with his or her students can be essential. Efficacy is a construct first defined by Bandura (2001) as, "people's beliefs about their proficiencies to produce assigned levels of performance that practice influence over events that affect their lives."

On the other hand, attitudes are central concepts in social psychology. Their definitions have evolved over the years. According to Eagly and Chaiken (as cited in Wiley Library 2012) attitude is viewed as an expression of favor or disagreement. Attitudes have also been broadly defined as encompassing cognitive, affective, motivational, and behavioral components. According to Kreitner and Kinicki (2007), attitudes reflect the extent to which people like their job. Hence, emphasis on the assessment of science teachers' attitude in doing action research was highlighted.

An increasing number of university faculty members appreciate the role of a classroom teacher who are offering a valuable research perspective -Richardson (as cited in Wong 2016). However, striving to be both a researcher and a teacher present unique and serious challenge. According to the study Challenges Confronting the Researcher/Teacher: Conflicts of Purpose and Conduct of David Wong (cited in Educational Researcher 2016), teaching science by nature is based not only on theories but also on practicality. He further encourages that educators must continue the process of improving and developing through actively involving oneself to transform the traditional classroom into an experiential learning process. Challenges are included in the process; thus, proper attitude and discipline is needed.

Participation is needed in conducting action research; however, not merely for autonomy but also for responsibility where the principles of Action research is grounded. It is not a simple engagement to initiative and consideration for taking action to call for change but more so a call to narrate and assess experiences in a scientific manner.

In the words of Lawrence Stenhouse (cited in International Journal Educational Development 2014), teachers would always remain the key element in improving the school system. While engaging in action research, teachers intensify their perception of the instruction process. Teachers who continuously pursue learning will have a great influence on what happens in classrooms, schools, and division in the future.

These explications led the researcher to a truthful reality check through designing a conceptual framework that shows and seeks the level of teachers' perceived efficacy in science teaching that reflects into three correlated factors. The three factors that emerged from Tschannen-Moran and Woolfolk Hoy's (2001) work are ones critical in the school environment. Chapman (2003) notes that children with a higher level of student engagement "show sustained behavioral involvement in learning activities…select tasks at the border of their competencies, initiate action when given the opportunity, and exert intense effort and concentration" Like student engagement, classroom management is important if student learning and achievement is to be at an acceptable level (Akin-Little, Little, & Laniti, 2007). As with engagement and management, instructional practices are important for student achievement. Research shows that instructional practices that engage students and encourage higher-level thinking are more likely to be effective in raising achievement (Hamilton, et al., 2003)

The framework also shows and seeks the level of teachers' attitude in doing action research in its three areas - perceived competence, organizational support and the interest in action research. Science Teachers' Attitude was based on 3 areas. First, the perceived competence has been assessed in various studies to predict maintained behavior change effective performance and internalization of ambient values. (Self -Determination Theory.org) Another area is organizational support was adapted from the study of Coyle-Shapiro and Conway (2005) It is considered the degree to which the employees believe that their organization values their contributions and cares about their well-being. And the last area is the interest in action research it is considered the most direct measure of the intrinsic motivation. The subscale assesses the interest and inherent pleasure when doing a specific activity (Intrinsic Motivation Inventory), in this study doing action research. The line connecting teachers' efficacy and teachers' attitude established a relationship between teacher's efficacy and teachers' attitude in doing action research.

Since teachers' attitude and challenges go hand in hand in doing action research, attitude and challenges are merged in one box. Teachers' experiences and how teachers value action research contemplated teacher's challenges in doing action research. Teachers challenges in doing research focus on two things teachers experiences in different stages of the research process and how teachers value action research in teaching and learning process. These challenges are necessary, particularly related to classroom practice, in order to lead to positive change. Action research puts the teacher in many new roles, teacher as researcher, teacher as decision maker (Mertler 2006) and teacher as a change agent. Implementing the action research process has helped inform daily instruction, and has

transformed, changed, and expanded teachers' curriculum perspectives, choices, and thinking.

The overall review of science teaching efficacy, attitude, and challenges in doing action research are viewed in the conceptual framework.

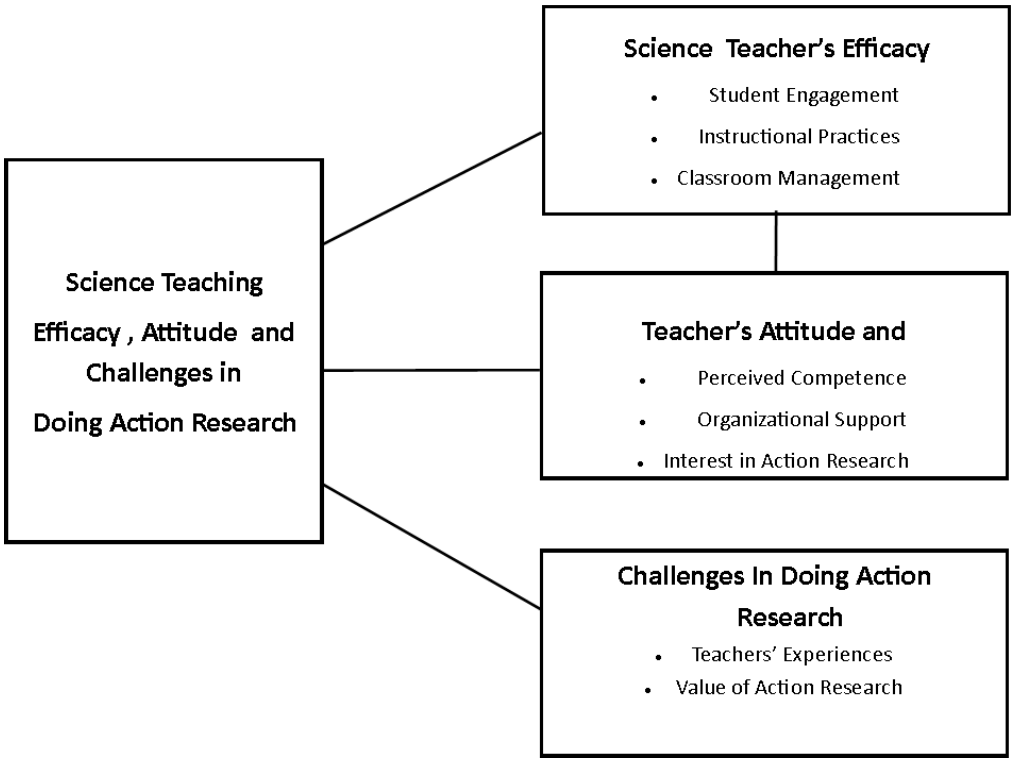

Figure 1
Conceptual Framework

RESEARCH PROBLEMS

The main purpose of this study is to appraise science teaching efficacy, attitude and challenges encountered in doing action research. This study attempts to answer the following questions:

1. What is the level of science teacher's perceived efficacy in science teaching and attitude towards action research?
2. What is the relationship between teacher's efficacy in science teaching and attitude in doing action research?
3. What are the science teachers learning experiences in doing the different stages of action research process?
4. What are the science teachers' perceptions of the value of action research to teaching and learning process?

SIGNIFICANCE OF THE STUDY

Schacter and Thum (2005) state that teacher effectiveness is the most crucial and definitive factor that delineates the concept of better student achievement. A teacher's level of efficacy is going to have a significant impact on a teacher's effectiveness (Henson, 2002). As with most professions, effectiveness can be improved through continuing education to inspire teachers to reflect about their teaching in different ways and to keep them abreast of changes to the world of education. This will invite the potential to build up efficacy as they see other teachers being successful with innovative techniques. Since teachers are the "specialists" in the classroom, resolutions about changes to the classroom should come from teacher-directed professional development, of which action research is an example.

In this study, school administration can empower a small group of teachers that will be the start of a ripple effect in figuring out a critical mass of effective teachers in cultivating future leaders. This will initiate further growth and change in their colleagues. With the shift towards school-based management, more schools can open avenues to work

as a faculty in creating school renewal wherein action research achieves that potential. Findings of this study can also provide useful information to school leaders at the district, division and local government leaders who are confronted with supplying innovative ways of improved professional development to educators. Moreover, it can support them in providing valuable instructional delivery to all students.

This also addresses the quality of students' education. The educational community is working to find ways that can equip educators to deliver effective teaching that can contribute to improve student outcomes. Action research is a method, or professional development model, that has been implemented to meet public and private demands on educators. With this, one can improve data gathering techniques based on the viewpoints revealed by the learners themselves. Both new and seasoned teachers can be reframed using the perspectives given by the students through interviews, samples, surveys and observations so as to put emphasis in meeting the objectives set for the educational system.

Findings of this study will provide useful information for school administrators, teachers, students and even researchers who will have the opportunity to advance a deeper and wider sensitivity as well as an understanding of science teacher development. This will also pave the way to mark science teachers' perceptions of the successes and challenges they meet within the larger support of other relative factors.

SCOPE AND LIMITATIONS

To make the study manageable, the scope of the research was reduced to four (4) big public junior high schools in the Division of Malabon City. The schools were chosen

using a purposive sampling (Gay, Mills, & Airasian, 2006) to determine the schools based on administrators' and teachers' willingness to participate in the research.

The four big public junior high schools were the Malabon National High School, Tinajeros National High School, Longos National High School and Potrero National High School.A total of 60 junior high school science teachers were chosen as the respondents of this study who are teaching for the school year 2016-2017, regardless of the teaching position. Ten (10) out of 60 junior high school science teachers subjected to informal interview regarding their general view and perception about doing an action research. Fifty (50) of the junior high school science teachers were the respondents of the questionnaires.

Thoughts, attitudes, beliefs, perceptions, and behaviors of the participants were limited to those measured by the three instruments used in the study. The three instruments utilized were the Science Teachers' Attitude toward Action Research Questionnaire; Teachers' Sense of Efficacy Scale; and Science Teachers' Challenges Questionnaire. The duration of the distribution of questionnaires and data collection was limited to seven (7) days.

DEFINITION OF TERMS

In order to guide the readers to vividly understand and appreciate this research study, the following terms are hereby defined conceptually to provide a clear reference and to indicate the context in which they are used.

Action research. This refers to a methodical form of investigation in a school setting or environment with the purpose of gathering information on the operation process, teaching

strategies and the act of learning. In this study, it refers to the type of research quarterly done by teachers in the division of Malabon.

Attitude.It is described as the inclination of agreement and disagreement towards a certain activity or event. In this study, it represents the teachers' attitude in doing action research.

Classroom management.refers to the wide variety of skills and techniques that teachers use to keep students organized, orderly, focused, attentive, on task, and academically productive during a class. (Glossary of Educational Reform 2014). In this study, it is how the teachers handled the students in class in order.

Challenges.It is a difficult task or problem that is something hard to achieve ("Merriam-Webster Dictionary, 11th ed."). In this study, challenges refer to the difficulties encountered by a science teacher in doing an action research.

Instructional practices. This incorporates many facets of teaching, including the functions of teacher and student for the day; instructional resources that will be employed; the duties to be accomplished; and the process of evaluating student learning ("U.S. Department of Education, 1999"). In this study, it refers to the total functions of a teacher to efficiently move students towards their learning.

Student engagement. In education it refers to the student engagement refers to the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education. ("Glossary of Educational Reform 2014") In this study, student engagement refers how students are actively involved in the learning process, willing to

attempt tasks at the border of their ability and exhibit positive emotions regarding the learning process.

Teacher efficacy. can be defined as teachers' beliefs in their abilities to organize and execute courses of action necessary to bring about desired results. (Tschannen-Moran, Woolfolk-Hoy, & Hoy, 2001) In this paper, teacher efficacy refers to the expectation of a teacher to facilitate a positive teaching and learning process.

Science Teaching Efficacy. It discusses the viewpoints of teachers to be competent in effective learning. It is a positive predictor of student achievement at the school level (Henson, 2002). In this study, it explains the science teachers' capability of sharing and implementing their knowledge in a classroom setting.

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter presents the review of related literature and studies. The literature reviewed focuses on action research, teaching efficacy, science teaching, teachers' attitude and teachers' challenges in doing action research, which provided background materials for a comprehensive knowledge of the problem addressed in the study, which in turn helped to build the research design.

ACTION RESEARCH

Stephen Corey first used action research as means of solving problems categorized in education (Ferrance 2004). He assumed that the pronouncements towards the difficulty encountered in teaching can be solved through scientific method (Ferrance, 2004). With this, educators were inspired to make use of hypothesis testing in order to aid them in enhancing their teaching practices.

Educators conduct the research and not an outsider in research. (Mills, 2007). It is a form of discipline with investigation process of actual practices implemented in teaching. From this, teachers learn to have self-evaluation and take positive change within the context of their classroom environment. Thus, it makes action research inquiry - based done by individuals or in collaboration. This is conducted in school, classroom or the entire system of education. It is a kind of procedure with a certain cycle of process and often tapping mainly qualitative methods (Mills, 2007) but occasionally using quantitative data gathering and exploration methods (Ferrance 2004). Mainly, it is done with the goal of describing, explaining and interpreting of the significant teaching experiences. In the existences since its expansion, action research continues to relentlessly influence the

educators as researchers and facilitators of learning Glassman, Erdem & Bartholomew (as cited in Wen J. Penga 2014).

As defined by Kemmis (as cited in O' Connor et al., 2006), "action research in education is a word used to designate a family of events in curriculum development, school improvement, professional development programs, and systems formation and policy development". In the study of Mertler in 2012 he mentioned that the heart of action research is reflection: practitioners involved in action research are expected to explore what they are doing, why they are doing it and what the impact has been after doing it.

Reinstated in the 1970s, the impact in action research started when teachers expressed their doubts and uncertainties towards the relevance of this kind of research done in accordance with the scientific method and the emphasis is on theories on pedagogy but not on the conventions (Ferrance, 2000). It made a lasting impression up to the advent of modernization and technology - the 21st century. In order to ameliorate the individualized system of teaching practices as well as the curriculum design implemented by the teacher in - service, action research is used for the groundwork programs. This is a scheme of gathering evidence and making educational transformations in, curriculum, policy, and school organization (Ferrance, 2004). Different researchers (Delong 2004 et al.) agree that action research has many definitions, interpretations, and forms.

In action research, educators explore their teaching practices rather than academics in order to analyze the results of these explorations, and to upshot constructive change in classroom environments. Educators can work unaided or in collaboration depend mostly on qualitative methodology; however, statistical analysis and other quantitative data gathering procedure are currently utilized.

On the other hand, monitoring the effectiveness of students is achievable through evaluating the teaching approach, materials used in the field and curriculum content as main topics for action research. Akerson & McDuffie, Cullen, Akerson & Hanson (as cited in Holter, A. C., & Frabutt, J. M. (2011).

Regular examination and introspection towards teaching practices applied in the field should always be part of the teaching procedures among educators. Briscoe and Wells as well as Lytle and Cochran-Smith (as cited in Mills, G.E. 2007) highlight the purpose of action research in the pedagogical system. Action research is said to be a medium in narrowing the differences between the theory and the reality of teaching since it aids the educators to fully comprehend the function of research and in effect, transforms the educational theory into actuality. Similarly, Akerson & McDuffie study (as cited in Goodnough, K. 2010).has the same connotation on action research as a form of inquiry into the teaching practices as it provides an authentic evaluation of the approaches and difficulties they encounter. Thus, it makes action research as a tool in growing professionally.

It is important to the teacher-researcher that action research is realistic for the reason that it is conducted within the context of school environment and experiences. Action research assists teachers in linking the results in the written work to the classroom implementation (Ferrance, 2000). Johnson and Button (2000) quoted a teacher - researcher about the power an action research has as an authority in establishing changes.

The development of new teaching techniques and practices through action research was reckoned to be beneficial to pre -service teachers since the educator's approach is verified and monitored by the student success. Continuous professional growth on an

outcome - based teaching and variation of responsibility in science education are noteworthy in the field of pedagogy (Capobianco & Feldman, 2010). Action research done by pre - service teachers could be considered as a feasible instrument in addressing and grasping the changes they recommended.

Capobianco & Feldman (2010) further explained that the scientific method and process of inquiry used in the classroom and taught to the students can be the same avenue to institute innovation in science education. When these innovations become actions in teaching science, then the educators in this field can make the strategies and experiences more open to analysis for educational change.

Likewise, Goodnough (2010) notes that using the conventional form of knowledge in the process of analysis and interpretation of findings, researchers, and teachers can partake in a systematic exploration of their individualized experiences. To be an effective practitioner is through adequate preparation and training as indicated in the researches done by pre - service teachers. However, pre-service action research studies have not received as much attention as in-service ones. Adding studies from the direct point of view of the pre-service teacher may provide valuable insight into the effectiveness of teacher education programs.

Self - efficacy is intensified as there is an increase in the responsiveness, reflection and motivation in science teaching. These benefits of action research had been realized in different studies. Similarly, the relationship between the professional growth brought by the development programs for teachers and its impact on teacher made research is examined. Cullen et al. (as cited in Mills, G. E. 2013) reported that educators cultivate the viewpoint of better versions of themselves as they crafted action researchers on their

classroom instruction. Furthermore, teachers are more intrinsically motivated to promote an improved instruction for themselves and their students.

Action research posits specific suppositions about the process involved in research making and the innovations to instill in the educational system Grundy (as cited in Cooper-Twamley, 2009). It challenges the separation of research from action; the separation of the researcher from the researched; assumptions about control of knowledge; and assumptions about the nature of educational reform."Action research is by, with, of, and for society, rather than on society" according to Reason & Bradbury, (as cited in Pardan, H. (2002). Traditionally, teachers have been the subjects of research in educational action.According to Lewin's fundamental pronouncement, research can never be recognized without initiating actions and in turn, action can never be initiated without a basis - that is, research by Marrow (as cited in Pardan, H., 2002).

Based on the research done by Cooper-Twanley (2009) participation in action research did impact teacher efficacy, especially in instructional practices. A teacher's willingness to continue as a teacher-researcher was also positively impacted for some participants.

Consequently, teachers can reproduce knowledge and feel privileged towards the transformation instigated by their action research. Having said this causal relationship between action research and teacher's perspective, there is a developing acknowledgment of this power among educators. Reformation comes from the inner circle of professionals rather than change imposition from an outsider's perspective. Through action research, "teachers transcend the truth of power through the power of truth" Whitehead, (as cited in Mills. G. E 2000). Action research makes teachers more independent in a professional

decision as well as coherent in constructing a foundation for their area of expertise; thus, a recognition of one's proficiency and efficacy.

TEACHER'S EFFICACY AND SCIENCE TEACHING

One research study directly related to this proposed research was conducted by Ross and Bruce (2007) regarding the effect of professional development on teacher efficacy. While there has been a large volume of research on measuring teacher efficacy (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998), Ross and Bruce note there has been relatively little reporting on interventions that increase teacher efficacy. This same issue regarding research related to the ability to change a person's self-efficacy was also addressed by Tschannen-Moran, et al. (1998) as important for future research. Ross and Bruce report that, "increased teacher efficacy occurred when the teachers accumulated experiences in which they (a) perceived themselves as professionally masterful, (b) observed teachers like themselves being successful, (c) persuaded each other that they could teach the new curriculum, and (d) engaged in stress-reduction practices.

"Teachers are required to have a forecasting and diagnostic tool on how to improve their approach in order for learning to occur because the fundamental purpose of teaching is to achieve student success. This is one of the relevant indicators of a mentor's performance. Efficacy is a construct identified by Albert Bandura (as cited in Cooper-Twanley 2009) wherein a person's perception towards their ability affects the kind of professional performance he/she will have as it will make an impact on their lives in the long run. In application to the educational system, it is the self-efficacy of teachers put into the context of the possibility of success at a given task. Bandura (as cited in Cooper-

Twanley in 2009) distinguishes the idea of efficacy expectations from outcome expectations. He specified that an efficacy expectation is a principle of accomplishing the task with the desired result in mind versus the expectation of how well the outcome will match the ideal.

On the other hand **science teaching** in a conventional manner that had been dependent, to a great extent on readings, lectures and discussions as well as demonstrations, but the primary objective of science teaching is to give knowledge and information about the world of today. Expanding the students' world view and interlink meanings through utilizing thematic and scientific patterns should be the ultimate trade of teaching this subject.

However the most concrete source of efficacy expectation is a success in the learning process. Being able to attain the objectives of the curriculum design has a greater impact on the teacher's performance since student success further increases the intrinsic motivation of the educator. With this context, other teachers would imbibe to recreate their classroom atmosphere as they learn vicariously from their fellow educators. Hence, teaching principles and philosophies can be further formulated as well as self - evaluation of the process done in the total teaching - learning process. Such a seemingly nebulous construct would even matter in relation to the process of educating. Surprising at first examination, yet according to researches, a definite relationship can be established between teacher efficacy and student performance.

Furthermore, "talking science" is one concept generated to answer conflicts through written works or to communicate concerning concerns as deemed important in the field of science Lemke (as cited in Goodnough 2010). In the prevailing position in science

teaching would seem to indirectly stem from the merger of a functionalist notion of science and a pragmatic pedagogical approach, according to the "progressive" model worked out by John Dewey (1859-1952).

A teacher's expectation of how well-behaved the students will actually be related to outcome expectations. Pajares (2001) notes that self-efficacy is not synonymous with self-concept. Instead, Pajares states specifically the difference between self – concept and self – efficacy since the latter focuses on a certain context as a form of assessment if a specific objective is achieved or not. Ross and Bruce (2007) also make important observation wherein the effectiveness of a teacher is not based on objectivity. The idea of self-efficacy is vital to understand because it is a belief held by an individual that can influence an outcome prior to any behavior occurring. It is how well a person thinks he or she will perform in a given task (Bandura, 2001).

Schunk & Pajares (2002) summarizes the importance of efficacy by stating that an individual act and think according to their perception of oneself than what they are capable of accomplishing. With this, they can fully assess and maximize their potentials as facilitators of learning.This kind of power among the teachers to produce the desired result has a striking outcome on the way students can learn the subject effectively. It also has a definite impact on teacher retention in the profession (Darling-Hammond et al., 2006). Research on how to measure a teacher's sense of efficacy has gone hand in hand with research on the importance of the construct. An evidential relationship exists between the potential to be successful and the actual outcome of success. Efforts to develop a more in-depth instrument have continued ever since.

As cited in Bandura's analysis (2001), social cognitive and self-efficacy theories have been the groundwork of teacher efficacy in terms of theoretical approach. Teacher efficacy, as a definition, is viewed as the evaluation of the teacher's own ability to realize the anticipated results based on the academic status of students, either struggling or indifferent. (Dellinger et al., 2008) describes the term as the self-confidence to fully perform the effective process of teaching and learning occurring inside the classroom.

Significant goals in science practically involve a scientific breadth of scientific knowledge and method as well as social conflicts and personal awareness. These aims had been constituted as objectives of learning science. Nevertheless, in specific situations, these functions remain with an unequal level of relevance. But these have been the main goals for transfer of learning.

Tschannen-Moran and Woolfolk-Hoy (2001) suggest that a teacher's sense of efficacy affects the effort they invest in the process of educating the learners, the objectives to achieve and the level of motivation to teach. Teacher efficacy can be connected to a teacher's ability and motivation to teach (Vartuli, 2005).

One such effort resulted in the development of the Teachers' Sense of Efficacy Scale (TSES) by Tschannen-Moran and Woolfolk Hoy (2001). This instrument found that efficacy loaded onto three factors: efficacy for student engagement, efficacy for classroom management, and efficacy for instructional practices. According to Ross & Bruce (2007), this data gathering device has been tested and proven for validity and reliability; thus, it is considered a standard in non-content specific efficacy measurement. Since teacher efficacy has been shown to be such an important construct, it seems critical to consider the

possibility that there is a way to increase teacher efficacy through some sort of professional development.

Considering the form of science teaching efficacy philosophies, introduced by Riggs and Enochs (as cited in Capobianco-Feldman 2010), is dissimilar from overall teaching efficacy beliefs. It differs from how it states specifically to beliefs about the assurance level that individuals have in their capacity to influence student learning correlated to science.

Action research has been supported by many as having the effect of increasing teachers' feelings of empowerment (McNiff & Whitehead, 2006). What has not been answered in the literature is whether participation in action research can actually increase a teacher's sense of efficacy or not; thereby, potentially increasing student achievement.

Coldarci (as cited in Henson, 2001) explains that teacher efficacy is the strongest predictor of teacher expectations regarding student achievement and a significant predictor of teacher effectiveness. Woolfolk-Hoy et al. (2008) assert that the belief in oneself as an educator molds the capability of the teacher to perform in a maximum level which results in a commendable execution of the curriculum and instruction. This would further reinforce the scholastic achievement among students; thus, a higher sense of teaching efficacy. Teachers with high efficacy beliefs set high goals and thus promote greater scholastic performance (Goddard et al., 2004).

Researchers (Ashton & Webb; Fritz, Miller-Heyl, Kreutzer & MacPhee; all as cited in Collier, 2005) discuss that the higher the teaching efficacy of an educator, the more effective he/she in her teaching performance in the class. Good and Brophy (as cited in Williams-Payne T.C 2013) also suggest that as teachers' sense of efficacy increases, their

creativity and motivation towards designing instructional approach also increases. This is to enhance student learning, to take risks in the classroom, and to maintain high levels of student engagement.

Ross and Bruce (2007) concluded that teachers with high efficacy try new things, have clearly articulated expectations, focus on student needs, and influence student achievement positively. Since teacher efficacy is recognized as one of the crucial factors in the enhancement of classroom management, an emphasis has been placed on the difference between high and low teacher efficacy. Teacher efficacy can be related to teacher perceptions regarding difficult students and to the decisions teachers make when interacting with students in the classroom (Tucker et al., 2005). Shahid and Thompson (as cited in Ross J., & Bruce 2007) compare and contrast teachers in terms of the types of teaching techniques used based on the level of teaching efficacy they have. The willingness among the educators with a higher sense of teaching efficacy is prominent than the ones with low teaching efficacy since the former utilize innovative teaching strategies and ideas that challenge students within the classroom.

Learning by doing and experiential learning as means in studying various scientific events can enhance students' scientific talk. The art of questioning and making rational conclusions should be demonstrated by science teachers since these two strategies can eliminate students' doubts and uncertainties towards the world they are living in. Scientific vocabularies, as part of technique, can further train students' viewpoint on interlinking meanings of significant human experiences.

Some researchers have verified the relationship between student achievement and teacher efficacy (Woolfolk Hoy et al, 2008). As part of their study, Tschannen-Moran et

al. (2001) found that there were researchers recognized the greater impact of the teacher's efficacy on the learner's enthusiasm, attainment and efficacy. Woolfolk-Based on Hoy and Burke-Spero (2005), though several studies were made to prove teaching efficacy, it remains to be one of the neglected attributes in the educational system that is correlated to student achievement.

In the research done by Tschannen-Moran and Woolfolk-Hoy (2007), a relationship between teachers' sense of efficacy and their willingness to put forth an effort to meet the needs of their students has been identified. It was discovered that teachers with a higher sense of efficacy plan and organize more extensively, exhibit more resilience, and are committed to the teaching profession than the ones who are not. One could contend that it is the teacher's sense of efficacy that sets the tone for the outcomes of a learning environment. The strong correlation found between teacher efficacy and student achievement (Woolfolk-Hoy et al., 2006; Woolfolk-Hoy & Burke-Spero, 2005; Woolfolk-Hoy et al., 2008) is the reason why research regarding teacher efficacy is an ongoing endeavor.

In 2001, Tschannen-Moran and Woolfolk-Hoy developed the TSES - Teachers Sense of Efficacy Scale. Originally titled the Ohio State Teacher Efficacy Scale, this kind of measurement focuses on the several roles and tasks being handled by a teacher which proved the concept of multifaceted nature of teaching. After performing different studies to evaluate the validity and reliability of the instrument, the results revealed the credibility and dependability of the Ohio State Teacher Efficacy Scale as a data gathering instrument. In fact, it was found to be an instrument that assesses a wide array of salient features of good and effective teaching; hence, this is recognized as first-rate compared to other

measurement scales because of its coordinated and firm factor structure (Tschannen-Moran & Woolfolk-Hoy, 2001).

When developing the TSES, Tschannen-Moran, and Woolfolk-Hoy sought to address those issues identified in earlier teacher efficacy assessments. Those concerns included developing a measure that clearly and accurately reflected the meaning of self-efficacy.

The TSES instrument was developed from items taken from Bandura's unpublished instrument and items written by members of a seminar class at Ohio State University. In an effort to refine the TSES and increase reliability, three pilot rounds were completed with both pre-service and in-service teachers. Through this process, three subcontracts of teacher efficacy emerged: efficacy in student engagement, efficacy in instructional strategies, and efficacy in classroom management. Credibility in construction was established by correlating the TSES with both the Rand Measure and the W. K. Hoy and Woolfolk (2001) 10-item adaptation of the Gibson and Dembo Teacher Efficacy Scale.

The TSES is available in both long and short forms. The long form contains 24 items and the short form has 12 items. Both forms consist of a 9-point Likert-type scale where 1 = nothing, 3 = very little, 5 = some influence, 7 = quite a bit, and 9 = a great deal. Ross and Bruce (2007) noted that, because of its reliability and validity, the TSES is becoming the standard instrument to measure this particular element. Additionally, several studies confirmed the TSES is an effective instrument for measuring teacher efficacy (Fives & Buehl, 2010; Heneman, Kimball, & Milanowski, 2006; Tschannen-Moran & Woolfolk-Hoy, 2001).

Student engagement, classroom management, and instructional practices are the three constructs that emerged from Tschannen-Moran and Woolfolk-Hoy's (2001b) work regarding measuring teacher efficacy. These sub-constructs are essential to understanding how teacher efficacy affects the classroom.

Teachers with strong efficacy for student engagement believe they can positively impact student outcomes. Chapman (2003) purported that students with high levels of student engagement exhibit a consistent active participation in all areas of learning activities through task making, initiative, focus, and demonstration.According to Ross and Bruce (2007), a study was conducted to assess the effects of professional development on teacher efficacy, with results indicating an increase in teacher efficacy scores. In a study conducted by Fritz et al. (2001), the premise of increasing teaching efficacy is based on satisfactory development at professional level since there is a significant relationship between the two as evaluated and presented in the results of analysis.

According to the study conducted by Eun and Heining-Boynton (2007) about English-as-a-second-language training program, it was indicated that teacher efficacy was the greatest forecasting tool towards the impact of professional development on teaching practices. Ross and Bruce (2007) conducted a randomized study of 106 elementary school teachers in order to determine same objectives on teaching efficacy among the educators specializing in the subject area of Mathematics. This kind of development in the field of teaching profession explicitly addressed the four factors of self-efficacy as identified in social cognition theory: mastery incidents, vicarious incidents, social influence, and physiological and affective conditions Bandura (as cited in Williams-Payne, T. C 2013). Ross and Bruce's findings indicated that teachers receiving the treatment outperformed the

controlled group in terms of classroom management only wherein outcome of the study conducted is statistically relevant.

In 2008, Overbaugh and Lu studied the influence of professional programs intended for K–12 participants' self-efficacy when learning and implementing instructional technology. The program included an online course for 6-week and face-to-face sessions for 2 weeks. Findings from the analysis of the 377 participants revealed that the program increased participants' confidence and competence in technology integration. Ng, Nicholas, and Williams (2010) concluded in their study of 37 pre-service teachers that avenues for the betterment of teachers in a professional and academic setting can significantly affect the teaching goals, approaches and learners' scholastic performance.

Asserted in the words of Kuskovski (2008), analytical studies can be further conducted to determine the possible correlation between the variables of teacher self - efficacy and professional growth. Twenty-eight secondary school teachers participated in the research. The teachers were selected on a voluntary basis from a number of international schools located in Switzerland. Two groups of teachers were involved - one receiving professional development and the other without the said program. Quantitative analysis of the data collected from the TSES indicated no evidence of any effect of professional development on teacher self-efficacy.

Although the results varied, the researchers consistently indicated the need for additional research on the construct of teacher efficacy. As the researchers suggested, this study is intended to add to the body of knowledge on teacher efficacy through an action research design that examined the extent to which professional development increases teacher efficacy and classroom practices.

From the findings of the study of Soprano and Yang (2012) has shown that as one develops his or her understanding of inquiry-based science, his or her confidence in planning and teaching inquiry-based science lessons also increases; thus, positive science teaching self-efficacy results. The findings suggest that including inquiry-based teaching early on in teacher education programs and allowing pre-service teachers to practice the methods taught in class before they become teachers helps to develop a strong self-efficacy.

TEACHER'S ATTITUDE TOWARDS ACTION RESEARCH

Understanding the importance of teachers' attitudes will strengthen professional development Darling-Hammond & McLaughlin,(as cited in Andronache 2014)). Gender influenced could be a basis for determining attitude of teachers. According to Dodeen, et al., 2003, it was found that gender has an influence on the positivity of attitude among teachers. Female teachers are more constructive and optimist in terms of their attitude in teaching as compared with male teachers. Flores (2001) explored, from the recently graduated teachers, that what touches their attitude towards teaching profession is directed on social and political mechanism existing over teachers and the profession. It is additionally accounted for that the work station assumes a basic part in molding teachers' attitudes towards educating students particularly comportment about central and the nature of the communication inside the school.

Attitudes are general tendencies of individualized reactions towards an object, people, organizations, and happenings. This is utilized to comprehend and provide explanation on human behavior. Mostly, it is referred to as a psychological state of a person's mind based on beliefs which are formulated through relevant human experiences

as well as the definite response towards a specific stimulus. In a profession, attitudes play an essential role in shaping the performance of the teacher that are proven vital to the pedagogy.

It has been guaranteed that in the aspect of attitude a teacher's character may be a noteworthy element to calculate a teacher's conduct and has an incredible effect around student's accomplishment. The educators must recognize the symbolization of communication, comprehension and the capability in dealing with various encounters. They ought to have the ability to encourage learners to achieve their maximum potentials successfully.

Educators'state of mind generally relies upon their individual qualities and temperament wherein both appear with a chance to be exceedingly interlinked. Those who are involved in the teaching process were obliged to have certain prevailing practices which indicate teacher's cognitive capacity, emotional stability and sense of professionalism. Teaching is perceived as a tough task with different facets. Some would critic that teachers observe several complications when they had started teaching. It may root on adverse attitude towards the teaching profession. This kind of attitude plays an essential part to aggregate teaching-learning transformation.

The disconfirming attitude of a teacher might have a negative effect with respect to one's process of educating students. Aassociations have been studied between teachers' disposition and the actual process of teaching. Higher standards are required among teachers since they have the responsibility to educate the youth. It will be likewise accurate that in teaching, there were some educators who were not able to meet the standards of

expected performance, behavior and attitude. Moreover, many persons have used teaching as a stepping-stone to other professions. Some critics would question the teachers' commitment wherein duties and reliability are not accomplished sufficiently and reasonably.

Teachers were given the task to uphold virtues and values necessary for the process of molding children in order to conform to the societal standards and to do their moral responsibility in maintaining the social patterns. This kind of profession has been relegated to strengthen the core of society through basic formation of students' values in order to carry over the legacy.

This form of service is only possible if the teacher is a human being by nature - a humanist. He is somebody of high principles and pleasing attributes. Teachers were given a challenge of motivating students who are into learning already and those who are struggling. Educators are seen from the viewpoint of personal and professional qualities. Interpersonal intelligence is one of the recognized factors in effective teaching.

In the study of Katherine Anne Byrnes in 2009 regarding " Investigating Teachers about Action Research as a Professional Tool", the findings of this study illustrate the need to address teachers' attitudes with regard to professional development. The findings also support the need for additional research with regard to background characteristics that help shape program development. This study reinforces the need to question how staff developers should involve secondary subject specialist with action research.

TEACHER'S CHALLENGES IN DOING ACTION RESEARCH

In order to advance to a positive change, the demand to face struggles connected to teaching is widely acknowledged. One of the difficulties of Science teachers is teaching within and outside the area of expertise. Many educators experience dread and low self-esteem whenever confronted with the task of teaching Integrated Science among the students within the bracket age of 11 - 13 since the topics are varied and are not in their area of specialization Gatt,, Mizzi,(as cited in Ng, W. Nicholas, H.,& Williams, A 2010).

Action research opens an opportunity for teachers to be conscientious towards their teaching practices Cain & Harris, Hodgson (as cited in Wen J. Penga et al., 2014); encourage teaching perspective and approach modification Furlong & Salisbury, Zeichner,(as cited in Wen J. Penga et al.,2014) and promote self-improvement and self-awareness (Judah & Richardson, 2006). Based on the feasibility studies conducted by teacher - researchers, they found out that teachers who are still in - service but traditional and conservative in their approach tend to be evaluated as ineffective Barone(as cited in Porter et al., 2002). These research studies revealed that stakeholders commonly do not provide teachers enough professional growth to update themselves in paradigm shift and current trends so as to magnify the body of knowledge they have (Birman, Desimone, Porter, & Garet, 2000). Some challenges linked with the research methodology were enunciated.

The difficulties countered in conducting action research are also well - pronounced. Because of time constraints needed in accomplishing the action research process, teachers would often extend their schedule so as to meet the demands of teaching as well as the requirement of being a researcher. Hence, spare time is utilized in order to accomplish the said research task.

Case studies and surveys offer gripping insights to the extent in which new teachers usually struggle. By effectively referring these areas, schools can assist new to enhance their skills more quickly; thereby sustaining them in the profession and raising student achievement.

Action researchers, heedless of their philosophy and principle in practice, are required to be analytical in examining the classroom activities and tasks being implemented. Therefore, various suggestions were given by Holter and Frabutt (as cited inMcNiff, J., & Whitehead, J. 2006) on the criteria of conducting action research in education. It involves active participation, positivity, change - oriented, community - based and organized.

Individual challenges related with research design are also recognized through many benefits can be offered to the teachers. Educators may realize that it is a time-consuming practice to conduct research in accumulation actual teaching approaches (Hine, 2013). As such, these demands may impede the methodological rigor of presentation of data, its analysis and gathering procedure Waters-Adams (as cited in Hine 2013). As an outcome to the requirements of the education system, numerous authors mention the controversy between the pedagogical aspect and research process as unfavorable to the quality of teaching granted. Forster & Nixon, Wong (as cited in Pardan H. 2002)

Moreover, because action research is carried out by individuals who are interested parties in the research, the validity of collected and analyzed data may be questionably biased Waters-Adams (as cited in Gay, L.R., Mills, G.E., & Airasian, P. 2006. Brown (as cited inMills, G. E. 2013) intensifies this remark by proposing that teacher-researchers may

discover it thought-provoking to dissociate themselves from the condition being examined. Thus, they are unable to accomplish an unbiased perspective. A third test faced by action researchers is to append any predetermined ideas on the possibility of outcome in relation to the difficulty to be encountered. To determine the main and fundamental principle of action research, researchers must ensure the process of observing the educational environment, a reflection on the teaching practices and initiate actions. (Stringer, 2007). So, presumptuous of a course of feat without enacting an arduous approach that may be not productive to the research efforts overall. In its place, researchers must initially express to all project partakers before attaining at a resolution in order to advance in a precise manner with a design towards enhancement.

Findings from the study of Katherine A. O'Connor et al., found out that teachers consistently commented that the action research process made them more aware of their teaching practices and more cognizant of their students' needs. Action research empowered teachers to change by pushing a teacher out of his/her comfort zone. One of the big challenge teachers encountered was the data analysis phase, there is a need for statistical analysis during the action research process for graduate students.

SYNTHESIS

The above literature review was related to action research, teacher's efficacy, science teaching, teachers' attitude and challenges in doing in action research. Action research was discussed as a teacher-driven form of professional development or program

in which teachers explore their teaching practices. Action research linked the results of written performance of students to classroom implementation.

On the other hand teachers' efficacy was discussed in terms of the capability of teachers to bring about positive outcomes on teaching and learning process. This is with an emphasis placed on student's engagement, classroom management, and instructional practices, while science teaching is a conformist manner that involves lectures, discussion and demonstrations. However, science teaching through action research design, eventually increases teaching efficacy. The teachers' attitude led to the discussion on its influence on professional learning practices, thus attitude of teachers in the learning process may positively or negatively affect the process of educating students. Furthermore teachers' challenges were viewed as difficulties of science educators in teaching subject matter in varied topics. Some research challenges of a teacher, either positive or negative experience, were enunciated.

A critical review of the literature led to the conclusion that there are increasing studies on teachers' efficacy but there is limited research on the view of science teaching efficacy, attitude and teachers' challenges in doing action research. Hence, it was deemed necessary to assess science teaching efficacy, teachers' attitude, and challenges encountered in doing action research

CHAPTER III

METHODOLOGY

This chapter provides an explanation of the research design, target population, selection criteria for participants, and methods for data collection and analysis. The chapter concludes with an assessment of the research quality through the discussion of strategies that ensured trustworthiness, ethical and scholarly behaviors, and proper management of conflicts of interest.

RESEARCH DESIGN

A mixed methods approach to data collection and analysis was employed in this study. Gay, et al. (2006) stated that the function of conducting a mixed methods study is to "build on the synergy and strength that exists between quantitative and qualitative research methods in order to understand the phenomenon more fully than is possible using either quantitative or qualitative method alone"

Elements of both qualitative and quantitative research design are combined in a single study. The quantitative part of the study utilized specifically descriptive correlational research. Descriptive research explained the trends being studied. After data gathering, descriptive statistics are then used for analysis. Descriptive research predictably exemplified what appears to be proceeding and what the significant variables appear to be. Conversely, the associations among two or more variables were determined using correlational research. Data were collected based on various variables and statistical analysis in correlational studies are then utilized for the information gathered (Lomax 2013).

The qualitative portion of this study followed thematic analysis.Thematic analysis is "a method for identifying, analyzing and reporting patterns within data" (Braun and Clark, 2006) Itis historically a conventional practice in qualitative research which involves searching through data to identify any recurrent patterns. Informal interview was used in the qualitative procedure, in the discovery of what other challenges teachers encounter in doing action research. Verbal responses were analyzed and transcribed. Coding data were done. "Coding is an explicit and iterative process in which analysis will alter and modify as reflected by the data and as ideas emerge" (Michi Komori 2015). Next, codes were validated and those that are associated to a customary contention were categorized together and focus on a broader level of themes. The fourth step involved reviewing the level of the coded data that fit into each theme. Next step done was capturing the essence of what each theme is about and what aspect of the data each theme captures. Overall narrative with all of the data was then created.

RESEARCH LOCALE

The study was conducted in Malabon City where the researcher is currently teaching. It has a population of 365,525 as of 2015, it is located in the north of Manila. It is one of the most densely populated cities in the metropolis. Moreover, it is predominantly a residential and an industrial town. It has a total land area of 19.714 square kilometers ("Revolvy- Malabon"). At present, there are eleven (11) public junior high school in the Division of Malabon City. The nine public secondary high school and two annexes are as follows: Malabon National High School, Tinajeros National High School, Acacia Annex, Tañong National High School, Tañong Integrated School, Longos National High School, Malabon VocTech Annex, Potero National High School, Panghulo National High School,

Catmon Integrated School, Camus Integrated School and Concepcion Integrated School. The four big junior high schools are Malabon National High School, Tinajeros National High School, Longos National High School and Potrero National High School. The latter were the chosen schools where a total of fifty (50) teachers were considered as the respondents of the questionnaires of this study. Ten (10) science teachers from other schools were considered as subjects for the random interview. There was no risk identified of being the respondents of the study since the questionnaires were answered inside the school premises and within Malabon City. The informal interview was random and also done within Malabon area.

Figure 2
Map of Malabon City
Photo Credits : https://www.revolvy.com/main/index.php?s=Malabon%20City&item_type=topic

SAMPLING AND RESPONDENTS

Purposive sampling technique was utilized in determining the respondents of the investigation at hand. The research population involved science educators that are working in the four (4) big public national junior high schools, under the division of the City Schools of Malabon. The four (4) big national high schools are namely Malabon National High school, Tinajeros National High School, Potrero National High School and Longos National High School. The science teachers in the said schools that are teaching for the school year 2016-2017 were chosen as the respondents of the study, regardless of the age, gender, teaching position and post-graduate educational attainment.

Science department heads and science coordinators were not included as respondents of the study. A total of 60 junior high school science teachers were chosen as the respondents of this study who are teaching for the year 2016-2017 regardless of the teaching position. Ten (10) out of 60 junior high school science teachers subjected to an informal interview, those were teachers from other schools that were not the respondents of the questionnaires. Fifty (50) of the junior high school science teachers were the respondents of the questionnaires.

INSTRUMENTS OF THE STUDY

After seeking the permission from the division office, the researcher waited for the endorsement of the division superintendent. Through the principal and to the department head and coordinator of the school, primary goals of this paper were discussed by the researcher. Giving the informed consent form and the questionnaires for the respondents, the researcher explained how the questionnaires will be answered. Contact numbers of the

researcher were provided in case there is a need for other clarifications. In regular department meetings, the school head or coordinator provided the complete information to the respondents regarding the nature of the study. In that case, information about the research questionnaires was included so that it will not interfere with the respondents' classes so as to avoid conflict with the researcher's schedule.

The respondents were given a week to answer the questionnaires: the Teaching Sense of Efficacy Scale, Science Teachers' Attitude Towards Action Research and Teachers' Challenges in Doing Action Research. Free time or vacant period of the respondents within the span of one week was encouraged to use in answering the questionnaires. They were given an assurance that answering the questionnaires will not interfere with their regular teaching schedule and other regular programs of the school.

Part of the questionnaire was the teachers' demographic profile. It served as an optional for the respondents to indicate age, gender, present teaching position, the length of teaching experiences and degree attained. However, it may be a basis for other reference in this study.

Teachers' Sense of Efficacy Scale (TSES)

Teacher Sense of Efficacy Scale was adapted and utilized in this study. This instrument was developed at The Ohio State University (Tschannen-Moran & Woolfolk Hoy, 2001). Respondents completed the long form (24 item scale). This is a validated and reliable instrument measuring teacher efficacy quantitatively using 24 items on the long form. The instrument followed a Likert scale model wherein respondents ranked a series of statements on a scale from one (1) meaning nothing, to four (4), meaning a great deal.

This instrument had established reliability and validity with an alpha of 0.94, which indicates “the degree to which the items or tasks in the assessment measure similar characteristics” (Linn & Gronlund, 2000). During their validation of the testing instrument, Tschannen-Moran and Woolfolk Hoy (2001) established that questions can be classified as student engagement (SE), instructional practices (IP), and classroom management (CM) using a screen analysis and factor analysis with a varimax rotation. Specifically, it was determined that questions 1, 2, 4, 6, 9, 12, 14, and 22 loaded on the factor of student engagement; questions 7, 10, 11, 17, 18, 20, 23, and 24 loaded on instructional practices; and questions 3, 5, 8, 13, 15, 16, 19, and 21 loaded on classroom management. Table 1 shows the reliabilities for each of the subscales and the TSES (referred to in this table as the Ohio State Teacher Efficacy Scale (OSTES).

Table 1

Reliability Data for the TSES, Long Form (Tschannen-Moran & Woolfolk Hoy, 2001)

Items Number	Construct	Mean	SD	alpha
	OSTES	7.1	.94	.94
1, 2, 4, 6, 9, 12, 14,22	Engagement	7.3	1.1	.87
7, 10, 11, 17, 18, 20, 23,24	Instructions	7.3	1.1	.91
3, 5, 8, 13, 15, 16, 19,21	Management	6.7	1.1	.9

Tschannen-Moran and Woolfolk Hoy also established construct validity through establishing a concrete relationship between the new data gathering material and the other existing instrument for teacher efficacy. Specifically, “reliabilities for the teacher efficacy subscales were 0.87 for engagement, 0.90 for management and 0.91 for instruction." (Tschannen-Moran & Hoy, 2001). It was significant to conduct a factor analysis to establish how partakers reply to the questions. Subscale scores were provided for the moderately correlated factors: Efficacy in Student Engagement, Efficacy in Instructional Practices, and Efficacy in Classroom Management. Unweighted means of the items that load on each factor were computed. Then, reliabilities were based on In Tschannen-Moran, M., & Woolfolk Hoy, A. (Teacher efficacy: Capturing and elusive construct *Teaching and Teacher Education 17, 783-805,* 2001*).*

Science Teachers’ Attitude towards Action Research

Adapted from a study of the attitudes of secondary public school teachers toward action research (Cabusao, et al., 2015), The Perception of Competence Scale was based on an instrument that assesses constructs from Self-Determination Theory. This is recognized as one of the most reliable instruments created to evaluate constructs from SDT. The Organizational Support Awareness Scale was adapted from the study by Coyle-Shapiro & Conway (2005) on psychological contracts and perceived organizational support. The Interest Scale was based on a multidimensional measurement device with six subscales called as Intrinsic Motivation Inventory (IMI). One of these was the interest/enjoyment subscale which was considered the self-report measure of intrinsic motivation. The survey form was modified as to make it suitable to the nature of the participants and to limit cultural biases. The 40-item survey had a Likert scale with designated response choices

including agree, slightly agree, disagree and strongly disagree. Cronbach's alpha, the reliability statistics widely utilized in the current times, quantifies the mean correlation of items in a survey questionnaire or the internal consistency to measure its credibility as an instrument.

Teachers' Challenges in Doing Action Research

There are two parts of questions for the 15-item survey. This was adapted from a study "Action Research: A Tool for Improving Teacher Quality and Classroom Practices" by Katherine O'Connor et, al. (2006). Four Likert scale items were utilized in the introductory part of the survey. The respondents were requested to rank the dilemmas encountered in relation with the elements of the research process. They were also encouraged to encircle the reason of choosing the difficulty level for his/her answer. Reasons were asked to be written specifically if it was not listed among the given choices.

With regards to the relevance of the action research they conducted, respondents were asked to rate their agreement with each statement using a four - point Likert scale. This second part of the questionnaire was composed of five statements.

The final section of the survey was composed of five questions focusing on the impact of active participation to the careers, approaches and practices in teaching and instruction. Whereas, the other two questions involved issues afflicting the teacher - respondents in relation with the implementation of action research program and the process of solving it. Specificity of the answers was required among the respondents whose choice is not listed among the given options.

Information gathered from the instrument were analyzed using content analysis which was recognized as a technique in qualitative criticism and utilized organization of the explanation among categories through tallying the number of occurrences (Silverman, 2001).

VALIDATION OF INSTRUMENTS

The survey instrument on Teachers Attitude in doing Action Research was adapted from the study of Rosario Cabusao, Zugar Dequillo and Jayferson Panilo. And it has been validated and used in their paper entitled "The Attitudes toward Action Research of Secondary Public School Teachers" for their Masters' degree at Philippine Normal University in 2015.

Table 1 shows the reliabilities for each of the subscales and the TSES (referred to in this table as the Ohio State Teacher Efficacy Scale (OSTES). As cited by Dalanon in 2010, the validity of self- efficacy as a ground for teacher competency has been proven by past studies Junhel C. Dalanon of Southwestern University, Cebu City worked with his thesis entitled "Teachers Sense of Efficacy Scale (TSES) In Inclusion Classes" and used Teacher Sense of Efficacy Scale byAnita Woolfolk Hoy, making the questionnaire to be validated here in the Philippines.

Teachers' Challenges in Doing Action Research was adapted from Katherine A. O'Connor, H. Carol Greene and Patricia J. Anderson in their study entitled Action Research: A Tool for Improving Teacher Quality and Classroom Practice. It was made of 3 parts. The first part was made of two tier questions, the second and third part was a multiple choice questions. In two tier questions the part of justification of the answers were

an open ended question. So choices were made for the convenient of the respondents. Ideas were gathered by asking the non-science teachers of Malabon National High School, who experienced doing an action research to answer the open ended questions, written in strips of paper (Appendix B). Then, answers were gathered, synthesized and made them part of multiple choice responses. Synthesized answers were validated by the research adviser who also served as science investigation and action research faculty too.

DATA GATHERING PROCEDURE

Approval was obtained from the Schools' Division Superintendent before the administration of the survey questionnaire. Once acknowledged, the researcher proceeded to the four (4) public national high schools of Malabon and secured the permission of the school principals to administer the three instruments to science teachers. The school head and coordinator were briefed about the objectives of the study. They were asked to be of assistance in giving the researcher a short time to orient the respondents about the research process. Before giving the informed consent form to the respondents and before answering the questionnaires, the respondents were oriented about the following:

1. The nature of the study,
2. The general objective of the study,
3. How respondents are chosen,
4. How long the project is to last,
5. and; the clarification that there is no funding source for the study.

Briefing the respondents on how confidentiality were maintained (code numbers and letters, instead of names); storage of data; and, confirmation that the researcher had

not revealed responses of the participants. Other matters about the content of informed consent form was also discussed.

The respondents completed the Teachers' Demographic Information. Afterwards, the questionnaires on Teachers' Sense of Efficacy Scale (TSES), Science Teachers Attitude on Action Research and Teacher's Challenges in Doing Action Research were administered.

Interviews were designed to gather descriptive data on teachers' conception of their roles, work attitudes, challenges in doing action research, and how they viewed themselves and their experiences (Patton, 2003). Informal interviews were used as part of the study in order to foster 'low pressure' interactions and to allow respondents to speak more freely and openly.

Informing the respondents that the researcher has ongoing thesis writing, the researcher talked to some respondents in the field informally without the use of a structured interview guide of any kind. Random questions were dispensed about how teachers deal with their experiences in doing action research, tried to remember the conversations with respondents through the usage of jottings or brief notes taken in the field to help in the recall. Informal interviewing went hand-in-hand with respondents' observation. The researcher acted as an observer in a casual conversation with the respondents. Observations were made on how they react with the topic being discussed. A maximum of ten (10) respondents (that were assigned as teacher A to teacher J) were considered as the sampling for the informal interviews. Age, gender, teaching position and post-graduate educational attainment were not considered. Going out with science teachers from other schools, or

even a chat during a division event were the approaches used by the researcher to build rapport. Informal interviews were done anytime from August to October 2016. A span of fifteen (15) to twenty (20) minutes were used to have an informal interview.

A week was allotted before the retrieval of questionnaires. All the information from the respondents was handled with utmost confidentiality. Information was not made available to anyone who has no direct involvement in the study. The retrieval of questionnaires was done for the analysis and interpretation of gathered data.

ETHICAL CONSIDERATIONS

For the basic ethical guidelines in the conduct of research, respect, justice and beneficence were the general principles taken into consideration during the process.

To show respect to the respondents, consent was asked first before they participate and they were entitled to withdraw anytime they want. The information of the participants was not made available to anyone who has no direct involvement in the research study. Thus, all the respondents' information was handled in utmost confidentiality.

To show justice, it was made sure that the selections of the respondents, data collection tools, and methodology were free from any biases. To resolve the conflict of interest, the manuscript was disclosed to the division where the study was conducted.

To show beneficence, it was made certain that the principals and the respondents were informed about the benefit that they may receive in the conduct of the study. This was made before the consent was given to the researcher by the respondents. The research results were shared to the respondents of the study. One way of sharing the results of the

study done was to furnish a copy of the results to the school principals and to the division office of Malabon so as to be utilized as a future reference. Another way of sharing the results of the study was through discussing the investigation done to the respondents in an annual research forum in the division of Malabon.

DATA ANALYSIS

Using a combination of the quantitative and qualitative forms of analysis, gathered data were then computed and analyzed. In qualitative analysis, the responses were analyzed using open coding. These are initial categories based on the condition being studied as dictated by the data gathered. Codes were then evaluated and those that are associated to a customary contention were categorized together. The next step involved categorizing, wherein the concepts were organized and reorganized based on a certain standard but the more advanced form of class is called category. It was in these two terms - concepts and categories - that direct the development of a theory.

Teachers' Sense of Efficacy Scale, Attitude toward Action Research, and the Teachers' Challenges in doing action research used descriptive statistics. Measures of central tendency and percentage ratings were also computed to establish statistical measurement.

The correlation between teaching efficacy and teachers' attitude was established. "The Pearson product-moment correlation coefficient or Pearson correlation coefficient. It is a gauge of the strength of a linear association between two variables and is denoted by r. Essentially Pearson product-moment correlation tries to draw a line of best fit through the data of two variables. The Pearson correlation coefficient, r, specifies how far away all

these data points are to this line of best fit (how well the data points fit this new model/line of best fit)" (Laerd Statistics).

STATISTICAL TOOLS

The data collected were analyzed and interpreted with the use of the following statistical tools:

The mean was used to obtain the average responses for each of the items in the questionnaires. It was considered the most reliable or accurate of all the measures of central tendency (Guilford 1987). Four point Likert scale was also used to determine what option best aligns with the view of the respondents. Percentage rating was utilized to show the percentage difference of the responses in different scales of the questionnaires. The standard deviation was also employed to measure variation.

In order to identify the relationship existing between the teachers' efficacy in science teaching and attitude in doing action research, Pearson r or Pearson product-moment correlation was used accordingly.The significance of relationship was based on the 0.05 level of significance.

METHODOLOGICAL LIMITATIONS

This study is limited using the three sets of questionnaires: Teacher Sense of Efficacy Scale by Tschannen-Moran & Woolfolk Hoy, 2001, Science Teachers' Attitude towards Action Research by Cabusao, et al. 2015 and Teachers Challenges in Doing Action Research by Katherine O'Connor et, al. (2006).

Quantitative analysis was done using the data gathered from the responses of teachers in the three survey questionnaires. Teachers' respondents of the questionnaires were limited to 50 public school teachers from the four big schools in the division of Malabon.

Qualitative analysis was determined by the responses in the informal interview of only 10 teachers randomly chosen from smaller schools in the division of Malabon. The informal interview has no guidelines and it tackled only a general view and experiences of teachers in doing action research.

The statistical procedure used in this study were only percentage rating, mean, standard deviation, and Pearson product- moment correlation.

CHAPTER IV

Presentation, Analysis and Interpretation of Data

This chapter deals with the presentation, analysis and interpretation of data. The collected data was analyzed using both quantitative and qualitative methods to answer the research questions. The principal purpose of this research study is to assess Science teaching efficacy, attitude and challenges in doing action research from the four big schools in the Division of Malabon during the School year 2016-2017.

Research Problem 1. What is the level of science teachers' perceived efficacy in science teaching and attitude towards action research?

The teaching efficacy in doing action research was evaluated in three correlated factors namely, student engagement, instructional practices, and classroom management.

Table 2

Overall Level of Science Teachers' Perceived Efficacy in Science Teaching

Level of Agreement	A Great deal (high Efficacy)		Quite A bit (Moderate Efficacy)		Very Little (Slight Efficacy)		Nothing (Low Efficacy)	
Correlated factor	*f*	%	*f*	%	*f*	%	*f*	%
Students Engagement	200	50.00	177	44.25	23	5.75	0	0.00
Instructional Practices	162	40.50	208	52.00	29	7.25	1	0.25
Classroom Management	198	49.50	174	43.50	26	6.50	2	0.50

TOTAL	560	46.67	559	46.58	78	6.50	3	0.25

Rating Scale	1.00 - 1.75 Nothing (low efficacy)	1.76 – 2.5 Very little (slight efficacy)
	2.51 - 3.25 Quite A Bit (moderate efficacy**)**	3.26- 4.00 A great Deal (High efficacy)

Table 2 displays that by correlated factor evaluation, it reveals that in students' engagement, 200 (50%) of the teachers' responses belong to "a great deal" or high efficacy level. Likewise, 177 (44.25%) of the teachers' responses were evaluated as "quite a bit" or moderate efficacy level. The "very little" or slight efficacy level was only about 23(5.75%) of the responses. There was no response of "nothing" or low efficacy level.

The results also illustrate that on the correlated factor on instructional practices, 162 (40.50%) of the responses fell into "a great deal" or high efficacy level. This is a little lower when compared to students' engagement in terms of percentage ratings. A moderate efficacy level or "quite a bit" was given to 208 (52%) of teachers' responses .Teachers' responses under "very little" or slight efficacy level were only 29 (7.52%). Only 1 (0.25%) response fell under "nothing" or low efficacy level.

The correlated factor on classroom management has high efficacy level or "a great deal" by 198 (49.50 %). Further results show that 174 (43.50%) is moderate efficacy level or "quite a bit". Only 26 (6.50%) of the responses under slight efficacy level or "very little". "Nothing" or low efficacy level was noted only at 2 (0.50%) of the responses.

The overall perceived efficacy in science teaching, 560 (46.67%) of the responses of teachers had ratings falling within the highest level of agreement as "a great deal" or high efficacy level. It had a slight difference in 559 (46.58%) of responses as "quite a bit" or moderate efficacy level. Only 78 (6.50 %) of responses is "very little" or slight efficacy level. The least rating was 3 (0.25%) which described as "nothing" or low efficacy level.

That result of the teachers' efficacy is similar in the study of Dalanon (2010) where he observed that the degree of teachers' sense of efficacy (TSE) is above average. This has been interpreted as high performance of teachers in cognitive, motivational, affective, and selective processes. The results of the study establish a trend on the level of the perceived teaching efficacy of the Science teachers in the three correlated factors. Arranged in decreasing order, it is as follows: Students engagement > Classroom management > Instructional practices. This trend indicates that the responses of the teachers are highest in students' engagement, followed by classroom management and lowest in instructional practices.

The highest percentage in "a great deal" or high efficacy level, of perceived teaching efficacy of science teachers in student's engagement only implies the vital role teachers play in the learning process. Teachers believe that they can have a greater impact on the different issues for students. Students can be actively involved in the learning process. They can be willing to attempt tasks at the border of their ability and exhibit positive emotions regarding the learning process (Chapman 2003). Student engagement has been connected in promoting school completion (Anderson, Christenson, & Lehr, 2004; Brewster & Fager, 2000). Chapman (2003) notes that children with a higher level of student engagement "show sustained behavioral involvement in learning activities select tasks at the border of their competencies, initiate action when given opportunity, and exert intense effort and concentration".

The favorable evaluation of the teachers' perceived efficacy on classroom management can be attributed to how teachers manage the students in the classroom. "Classroom management involves creating a situation for which student on-task behaviors

are encouraged and off-task behaviors are reduced." (Goss & Ingersoll, 1981, as cited in Cooper-Twamley 2009). Despite its importance and the amount of time often spent working to improve classroom management, issues with it still rank at the top of most surveys related to teacher concerns about teaching, especially for new teachers (Darling-Hammond, et al.2006). It is quite impossible that educators with better teaching efficacy for management can have these kinds of difficulties; therefore, better way of addressing classroom management issues quickly.

Moreover, the instructional practices rank the least on the three correlated factors of perceived teaching efficacy. Instructional practices include many aspects of teaching such as materials, contents, tasks, and assessment (U.S. Department of Education, 1999). As with engagement and management, instructional practices are important for student achievement.

Research shows that instructional practices with better student engagement and with advanced mode of reasoning are more promising in being effective in elevating achievement (Hamilton, et al., 2003; Von Secker, 2002; Wenglinsky, 2002). Teachers with a higher sense of efficacy in the area of instructional practices will feel more able to successfully implement the types of instructional practices that would raise achievement (Ross & Bruce 2007).

Below is the table on the science teachers' perceived efficacy in science teaching. It shows the different indicators in the three correlated factors of teacher's efficacy scale, the

students' engagement, classroom management and instructional practices.

Table 3

Science Teachers' Perceived Teaching Efficacy in Science Teaching

Students Engagement				
Indicator	Mean	SD	Verbal Interpretation	Efficacy Level
1. How much can you do to get students to believe they can do well in school work?	3.68	0.51	A great deal	High Efficacy
2. How much can you do to help your students' value learning?	3.64	0.56	A great deal	High Efficacy
3. How much can you do to motivate students who show low interest in school work?	3.58	0.57	A great deal	High Efficacy
4. How much can you do to help your students think critically?	3.50	0.54	A great deal	High Efficacy
5. How much can you do to foster student creativity?	3.44	0.61	A great deal	High Efficacy
6. How much can you do to improve the understanding of a student who is failing?	3.42	0.50	A great deal	High Efficacy
7. How much can you do to get to through to the most difficult students	3.24	0.59	Quite a bit	Moderate Efficacy
8. How much can you assist families in helping their children do well in school?	3.04	0.67	Quite a bit	Moderate Efficacy
Weighted Mean	3.44	0.57	A great deal	High Efficacy

Table 3 shows the science teachers' perceived efficacy in science teaching as broken down into different indicators for student's engagement, instructional practices and classroom management.

For students engagement the indicator *How much can you do to get students to believe they can do well in school work?* got the highest mean of 3.68 and the indicator, *How much can you assist families in helping their children do well in school?* got the lowest mean of 3.04.This implies that teachers can encourage students to believe what they are capable of doing, but have strivings reaching families for the students to do well in school.

Instructional Practices				
Indicator	Mean	SD	Verbal Interpretation	Efficacy Level
1. How well can you respond to difficult questions from your students?	3.48	0.68	A great deal	High Efficacy
2. How much can you gauge student comprehension of what you have taught?	3.40	0.57	A great deal	High Efficacy
3. How well can you provide appropriate challenges for very capable students?	3.38	0.66	A great deal	High Efficacy
4. How much can you do to adjust your lessons to the proper level for individual students?	3.38	0.62	A great deal	High Efficacy
5. To what extent can you provide an alternative explanation or example when students are confused?	3.32	0.60	A great deal	High Efficacy
6. To what extent can you craft good questions for your students?	3.24	0.62	Quite a bit	Moderate Efficacy
7. How well can you implement alternative strategies in your classroom?	3.24	0.59	Quite a bit	Moderate Efficacy

5. How much can you use a variety of assessment strategies?	3.18	0.64	Quite a bit	Moderate Efficacy
Weighted Mean	3.33	0.57	A great deal	High Efficacy

For instructional practices, the indicator *How well can you response to difficult questions from your students*? got the highest mean of 3.48 and the indicator *How much can you used a variety of assessment strategies?* got the lowest mean of 3.18. This implies that generally, science teachers can deal with the students with difficult questions, but the lowest mean of the indicator from the instructional practices implies that using different strategies in assessing students is what science teachers need.

Classroom Management				
Indicator	Mean	SD	Verbal Interpretation	Efficacy Level
1. How much can you do to get children to follow classroom rules?	3.66	0.56	A great deal	High Efficacy
2. How much can you do to calm a student who is disruptive or noisy?	3.50	0.65	A great deal	High Efficacy
3. How well can you establish routines to keep activities running smoothly?	3.45	0.58	A great deal	High Efficacy
4. How much can you do to control disruptive behavior in the classroom?	3.44	0.61	A great deal	High Efficacy
5. How well can you establish a classroom management system with each group of students?	3.44	0.62	A great deal	High Efficacy
6. To what extent can you make your expectations clear about student behavior?	3.42	0.61	A great deal	High Efficacy
7. How well can you keep a few problem students form ruining an entire lesson?	3.24	0.69	Quite a bit	Moderate Efficacy
8. How well can you respond to defiant students?	3.15	0.69	Quite a bit	Moderate Efficacy
Weighted Mean	3.42	0.62	A great deal	High Efficacy

Rating Scale 1.00 - 1.75 Nothing (low efficacy) 1.76 – 2.5 Very little (slight efficacy)

2.51 - 3.25 Quite A Bit (moderate efficacy**)** 3.26- 4.00 A great Deal (High efficacy

For the classroom management the indicator *How much can you do to get children follow classroom rules*? got the highest mean of 3.66 and the lowest mean is the indicator that asks How *well can you respond to defiant students?* The mean reveals that science teachers can do well in disciplining students, but still have difficulties in dealing with students that resist behaving or conforming to what is asked or expected.

It is significant to point out that in the weighted means of the correlated factors, 3.44 is given to students' engagement; 3.42 for classroom management and 3.33 for instructional practices.

The findings of this study indicate that in general, science teachers' perceived efficacy is higher in students' engagement and classroom management compared to that of the instructional practices that received the lowest percentage of teachers' responses. However, the result yields to the definite answer to the initial question posed in this paper. It shows that the level of science teachers' perceived efficacy in science teaching is "a great deal" or high efficacy level. This means that there is an ease for the science teachers to handle the three correlated factors of the teacher efficacy scale.

Level of Science Teachers' Attitude towards Action Research

From research question number 1 it is also asked "What is the level of the attitude of the science teachers' towards action research? The following presentation, analysis, and interpretation of data shown in table 4 and 5 attempts to answer the second research question of the study reiterated above. The questionnaire on teachers' attitude toward

action research was evaluated in three areas, namely perceived competence, organizational support and interest.

TABLE 4

Overall Level of Science Teachers' Attitude in Doing Action Research

Level of Agreement	Agree (Positive)		Slightly Agree (Slightly Positive)		Slightly Disagree (Slightly Negative)		Disagree (Negative)	
Area	*f*	%	*f*	%	*f*	%	*f*	%
Perceived Competence	317	31.70	356	35.60	199	19.90	128	12.80
Organizational Support	187	37.40	215	43.00	43	8.60	55	11.00
Interest in Action Reseacrh	207	41.40	195	39.00	58	1160.	40	8.00
TOTAL	711	35.55	766	38.30	300	15.00	233	11.15

Rating Scale

1.00 - 1.75 Disagree (Negative) 2.51 - 3.25 Slightly Agree (Slightly positive)

1.76 - 2.50 Slightly disagree (Slightly negative) 3.26 - 4.00 Agree (Positive)

Table 4 shows the overall level of science teachers' attitude in doing action research, considering three areas namely: Perceived Competence, Organizational Support, and Interest in Action Research.

The area analysis of the science teachers' attitude in doing action research reveals that in the perceived competence 356 (35.60 %) of the teacher responses obtained rating as

“slightly agree” or slightly positive. While, slightly fewer responses, that was 317 (31.70%) was evaluated as “agree” or a positive level of agreement. It is noteworthy, however, that considerable proportion of the responses were considered “slightly disagree” or slightly negative and “disagree” or negative response in perceived competence as indicated by 199 (19.90%) and 128 (12.80%) respectively.

In the area “organizational support,” 215 (43.00%) of the teachers’ responses fell on the scale of “slightly agree” or slightly positive response. The 187 (37.4%) of the teachers’ responses which was interpreted as “agree” or positive response. Relatively negligible percentages of the teachers’ responses were evaluated as “slightly disagree” or slightly negative and “disagree" or negative response, with a percentage of 43 (8.6%) and 55 (11.0%) respectively.

In the last area which is the interest in action research, the greatest proportion of the responses were concentrated in “slightly agree” or slightly positive and “agree” or positive response. There were 195 (39.00%) of the responses is “slightly agree" or slightly positive; and, “agree” or positive level with 207 (41.40%). The remaining 58 (11.60%) of the responses were evaluated as “slightly disagree” or slightly positive. “Disagree” or negative had 40 (8.00%) of the responses.

Overall the evaluation on science teachers’ attitude in doing action research reveals that, in general, 711 (35.55%) of the responses obtained had ratings falling within a descriptive equivalent of “agree” or positive level. Also, 766 (38.30%) of the responses shows the science teachers’ attitude in doing action research as “slightly agree” or slightly positive level. A small portion of the responses that was 300 (15.00%) considers the science

teachers' attitude in doing action research slightly negative or with a descriptive equivalent of "slightly disagree". Closer to "slightly disagree" or slightly negative response was the descriptive equivalent of "disagree" or negative which covered a 223 (11.15%) equivalent of the responses.

In decreasing order, the result is as follows: Slightly agree> agree > slightly disagree > disagree or on the other hand, it is slightly positive > positive > slightly negative > negative. The study on the level of the teachers' attitude in doing action research establishes a trend in the three which is shown in decreasing order. It is as follows: interest in action research > organizational areas support > perceived competence. This trend indicates that interest in action research of the science teachers is higher compared to that of the organizational support. Least is on the perceived competence of the science teachers in doing action research. That implies that interest of the science teachers in action research is slightly positive, that is because many science teachers just started to develop an interest in doing action research. Similarly, a slightly positive level of organizational support is observed because schools and division officials just recently show support for teachers' research and development. Perceived competence rank to be the least in terms of slightly positive level, that could be represented by difficulties of some teachers in doing action research.

Generally the "slightly agree" or slightly positive attitude of science teachers in doing action research could be attributed to the prevailing competency of teachers in doing research. In current years, there has been an emergent readiness to close the breach among the teacher's world and the researcher's world. This tendency has several representations. One of the more seeming representations of this trend is the progress of action research

finished by teachers themselves or with academic affiliates as a way of cultivating teacher professionalism (Zeichner, 1993).

Table 5

Attitude of Teachers in Doing Action Research

Perceived Competence				
Indicator	Mean	SD	Verbal Interpretation	Attitude Level
1. I believe action research is useful in my profession as a teacher.	3.66	0.48	Agree	Positive
2. I find action research useful in my teaching practice.	3.64	0.53	Agree	Positive
3. I find action research interesting.	3.48	0.65	Agree	Positive
4. I believe teachers benefit from doing action research.	3.46	0.79	Agree	Positive
5. I believe teachers must conduct action research.	3.32	0.77	Agree	Positive
6. I am able to meet the challenges of action research.	3.26	0.66	Agree	Positive
7. I understand the fundamental principles of doing action research.	3.26	0.63	Agree	Positive
8. I like action research.	3.20	0.76	Slightly agree	Slightly positive
9. I am confident in my ability to conduct action research.	3.18	0.83	Slightly agree	Slightly positive
10. I can effectively analyze data obtained in the conduct of action research.	3.04	0.64	Slightly agree	Slightly positive
11. I possess the skills in conducting action research.	2.96	0.75	Slightly agree	Slightly positive

12. I can formulate research problems very well.	2.76	1.04	Slightly agree	Slightly positive
13. I am able to meet the demands of time, resources, and skills in the conduct of action research.	2.70	0.86	Slightly agree	Slightly positive
14. I find some concepts of action research confusing.	2.66	1.12	Slightly agree	Slightly positive
15. I feel scared to engage in action research.	2.58	1.16	Slightly agree	Slightly positive
16. I lack skills needed for the conduct of action research.	2.28	0.99	Slightly agree	Slightly positive
17. I am anxious about action research.	2.16	1.00	Slightly agree	Slightly positive
18. I find action research complicated.	1.98	0.94	Slightly disagree	Slightly negative
19. I feel pressured when doing action research.	1.92	0.92	Slightly disagree	Slightly negative
20. I have difficulties in time management in the conduct of action research.	1.74	0.66	disagree	Negative
Weighted Mean	2.86	0.81	Slightly Agree	Slightly positive

The indicator perceived competence "*I believe in action research is useful in my profession as teacher*" got the highest mean of 3.66 and the indicator of *"I have difficulties in time management in the conduct of the action research."* got the lowest mean of 1.74. This implies that more science teachers positively agree that action research is useful in the teaching profession. .On the other hand, a small number of teachers claimed that they have difficulties in time management in the conduct of action research.

Organizational Support

Indicator	Mean	SD	Verbal Interpretation	Attitude Level
1 .My superior encourages me to do action research.	3.32	0.89	Agree	Positive
2. My superior displays appreciation toward my efforts to conduct action research.	3.28	0.86	Agree	Positive
3. My institution provides ample training on the conduct of action research.	3.26	0.78	Agree	Positive
4. My superior values my contributions to research	3.18	0.83	Slightly agree	Slightly positive
5. My superior offers necessary help in my conduct of action research.	3.18	0.90	Slightly agree	Slightly positive
6. My superior takes pride in my action research undertakings and accomplishments.	3.08	0.88	Slightly agree	Slightly positive
7. My institution makes use of action research findings and recommendations in policy formulation and improvement of current practices.	2.98	0.94	Slightly agree	Slightly positive
8. My institution provides incentives for completed action researches.	2.94	1.08	Slightly agree	Slightly positive
9. My institution provides the necessary facilities and resources for action research.	2.88	1.00	Slightly agree	Slightly positive
10. My institution provides financial support to teachers who engage in action research.	2.58	1.11	Slightly agree	Slightly positive

Weighted Mean	3.07	0.92	Slightly Agree	Slightly positive

In the indicator organizational support tells "*My superior encourages me to do action research.*" got the highest mean of 3.32 and the lowest mean of 2.58 received by the indicator "*My institution provides financial support to teachers who engage in action research.*" This reveals that there is positive encouragement from the school administrations for the teachers to conduct action research but lack financial support to do it.

Interest in Action Research				
Indicator	Mean	S.D	Verbal Interpretation	Attitude Level
1. I appreciate the value of action research to my profession.	3.46	0.71	Agree	Positive
2. I find the conduct of action research thought-provoking and exciting.	3.44	0.76	Agree	Positive
3. I like doing action research because it engages me to think creatively.	3.34	0.82	Agree	Positive
4. I find action research intellectually stimulating.	3.32	0.87	Agree	Positive
5. I appreciate the value of interpreting statistical findings when doing action research.	3.30	0.84	Agree	Positive
6. I find action research very interesting.	3.14	0.88	Slightly agree	Slightly positive
7. I generally enjoy doing action research.	2.98	0.74	Slightly agree	Slightly positive

8. I like doing action research because it engages me to think critically.	2.98	0.94	Slightly agree	Slightly positive
9. Conduct of action research does not hold my attention at all.	2.76	1.04	Slightly agree	Slightly positive
10. I find the conduct of action research as boring.	2.66	1.12	Slightly agree	Slightly positive
Weighted Mean	3.14	0.87	Slightly Agree	Slightly positive
Overall Mean	3.02	0.87	Slightly Agree	Slightly positive

Rating Scale

1.00 - 1.75 Disagree (Negative) 2.51 - 3.25 Slightly Agree (Slightly positive)

1.76 - 2.50 Slightly disagree (Slightly negative) 3.26 - 4.00 Agree (Positive)

In the interest in action research, the highest mean obtained by the indicator "*I appreciate the value of action research to my profession.*" while the indicator *"I find the conduct of action research as boring*." got the lowest mean value. This implies that science teachers appreciate the value of action research in teaching and only few science teachers find no interest in doing it.

In the evaluation of science teachers' attitude in doing action research, the overall mean in the three areas was 2.98 as to their slightly positive attitude interpreted as "slightly agree".

Based on the study of Anderson, 1997; Clandinin & Connelly, 1996, it is said that the interest of teachers in doing action research serves as an inspiration for teachers' individual demonstrations of knowledge. That the documentation of their knowledge using accounts manifests their encounters and their daily administration of teaching challenges.

The gradual increase of organizational support also leads to the generally slightly positive attitude of teachers in doing action research.

Research Questions No.2 What is the relationship between teacher's efficacy in science teaching and attitude in doing action research?

The second research question indicated in this research paper is to find out the relationship of teachers' teaching efficacy in science teaching and attitude in doing action research. The data to answer this research question is given in table 6 as well as a discussion below.

TABLE 6

Correlation between Science Teachers' Teaching Efficacy and Science Teachers' Attitude in doing Action Research

	r value	*p* value	Remarks
Science Teachers' Teaching Efficacy	0.0293		Not significantly correlated.
Science Teachers' Attitude		0.839	

*Correlation is not significant at the 0.05 level (2-tailed)

Table 6 shows the relationship between science teachers' teaching efficacy and attitude in doing action research. It was determined using Pearson product moment correlation coefficient or Pearson r. Data in table 6 shows no significant relationship between the level of teaching efficacy in science teaching and attitude in doing action research. The relatively low computed r value was 0.0293 which implies that there is a weak relationship between perceived teaching efficacy and teachers' attitude in doing action research. This means that changes in perceived teaching efficacy are not correlated

with changes in the teachers' attitude in doing action research. There is a low correlation, so it can be generalized that the increase in perceived teaching efficacy has nothing to do with the attitude of the teachers in doing action research. Similarly, a decrease in perceived teaching efficacy is not because of the prevailing attitude of teachers in doing action research. The Pearson r value of 0.0293, which is by magnitude, is considered positive correlation but not significant, since the level of probability at 0.05 level is 0.839 which is higher than that of the r value.

In this study, the Pearson r results imply that highly effective teachers do not necessarily mean they exhibit positive attitude towards action research. Likewise, teachers who are low in efficacy do not really imply to harbor negative attitude towards action research. It is also important to note that correlation does not necessarily imply causation. It only implies that a teacher with high perceived teaching efficacy can also have a positive or negative attitude in doing action research.

Research Question No.3 What are the science teachers learning experiences in doing the different stages of action research process?

The Science teachers' learning experiences in doing the different stages of action research process are the main focus of the third set of questions since the set of questions are two tier questions. The data to answer this research question is given in table 7 and 8 under the science teachers' challenges in doing action research. The discussion is given below.

Table 7

Science Teachers' Challenges in Doing Action Research

(Learning Experiences in Doing Different Stages of Action Research Process)

Stages of Action Research	Easy	Not so easy	Difficult	Very Difficult	Total
	f	*f*	*f*	*f*	*f*
1A Defining a research question.	2	30	17	1	50
2A Writing the literature review.	4	27	18	1	50
3A Developing and writing research methodology.	3	24	20	3	50
4A Analyzing data.	1	24	22	3	50
5A Organizing and writing the findings.	4	26	19	1	50

	Mean	Remarks
1A Defining a research question.	2.34	Not so easy
2A Writing the literature review.	2.32	Not so easy
3A Developing and writing research methodology.	2.46	Not so easy
4A Analyzing data.	2.54	Difficult
5A Organizing and writing the findings.	2.34	Not so easy
Weighted Mean	2.40	Not so easy

Rating Scale 1.00 - 1.75 indicate easy, 1.76 - 2.50 Indicates not so easy
2.51 - 3.25 Indicates difficult level 3.26 – 4.00 Indicates very difficult level

From table 7, stages of action research, the data gathered aims to determine the learning experiences involved in the action research process. The implications of the results are consolidated in the discussion of table 8 reasons indicating difficulties in the stages of action research.

In **defining research question,** 30 out of 50 teachers answered "not so easy" and 17 answered "difficult". Only 1 considered it "very difficult" and 2 science teachers considered it "easy". As a whole, the mean revealed to be 2.34 for defining research question.

W**riting a literature review** got a mean of 2.32. There were 18 science teachers out of 50 that considered it "difficult" and 27 science teachers considered it "not so easy". Only 1 reflected it "very difficult", and 4 science teachers measured it "easy".

The third stage of doing action research is **developing and writing research methodology**. It received the highest mean of 2.46 with a "not so easy" remarks. Out of 50 science teachers, 24 answered "not so easy" and 20 answered "difficult". Both "very difficult" and "easy" interpretation got a score of 3. **Analyzing data** was described as "difficult" by the respondents and got the overall highest mean of 2.54. Responses were 24 for "not so easy", 22 for "difficult", 3 for "very difficult" and 1 as "easy".

Organizing and writing the findings got a mean of 2.34 which was generally described as "not so easy". Only 19 science teachers perceived it "difficult" and 26 teachers perceived it "not so easy". There were 4 science teachers who thought that organizing and writing the findings were "easy" and there was only one who responded as "very difficult".

Overall results of the science teachers learning experiences in doing different stages of action research were “not so easy” as indicated by 2.40 mean.

To support the results on science teachers’ experiences in doing the different stages of action research from table 7, reasons indicating difficulties in the different stages of action research are stated in table 8.

Table 8

Science Teachers Challenges in Doing Action Research

(Reasons Indicating Difficulties in the Different Stages of Action Research)

Reasons	*f*	%
IB Defining the research question.		
a. I don’t know how to formulate research questions.	2	0.80
b. I know what I wanted to do, I just don’t know how to word it.	12	4.82
c. I can formulate research questions but get confused once in a while.	32	12.85
d. I find it easy to formulate research questions	2	0.80
e. Others please specify: * *had difficulty giving specific action research.* ** *I don’t have enough time.*	1	0.40
2B. Writing the literature review.		
a. I find it difficult to search for sources the literature review.	21	8.43
b. I easily get tired of reading so I find it difficult to write literature review.	12	4.82
c. I find it interesting to read, so looking for sources and literature review is easy for me.	13	5.22
d. I have access to different online libraries and publications so there are no problems for literature review	2	0.80
e. Others please specify:* *I find it interesting to read but I don’t have time.* ***I don’t have time*	2	0.80

3B.Developing and writing methodology		
a. I don't have enough knowledge of developing and writing research methodology.	10	4.02
b. I don't know about the terms and technicalities in developing and writing research methodology	8	3.21
c. I can develop and write methodology given enough time and resources.	21	8.43
d. I can develop and write research methodology if I am working with my colleagues.	8	3.21
e. Others please specify: **Computerized work is my problem.* *** I don't have enough time.* **** I get confused what methodology to use.*	3	1.20
4B. Analyzing the data.		
a. I find it most difficult to analyze data in doing research.	7	2.81
b. I have a lack of statistical understanding that made the analysis complicated.	26	10.44
c. I have fun working with graphs and tables so I can present and analyze data easier	10	4.02
d. I have friends that can help me working with data analysis, so it is easy for me.	5	2.01
e. Others please specify: ** Difficulty in gathering data.* *** I don't have enough time.*	2	0.80
5B.Organizing and writing the findings.		
a. I don't know how to organize and write the findings.	1	0.40
b. I am confused on what to use in order to organize and write findings.	16	6.43
c. Given a complete data I can organize and write the findings easily	18	7.23
d. Given a good model to use, I can finish organizing and writing the findings of my study.	14	5.62
e. Others please specify: ** I don't have enough time.*	1	0.40

Computed mean in the different stages of research process was reflected in table 7. Then items from table 8 that were designated as 1B to 5B are assuring a set of reasons of the difficulties encountered by teachers in doing action research. The first component **defining the research question**, had a 2.34 difficulty mean. The option "I can formulate research questions but get confused once in a while," was one reason that had a percentage rating of 12.85. This was considered the highest among the items evaluated. The reason behind the respondent's "desire to do it but do not know how to word it" ranked second with a percentage ranking of 4.82. Negligible ratings on the reasons "I don't know how to formulate research questions" and "I find it easy to formulate research questions" got a rating of both 0.80 Another reasons given for the item on defining a research question were "had difficulty giving a specific action research" and "I don't have enough time." This implies that overall, science teachers have a little difficulty in defining the research question as indicated by "not so easy" remarks with a mean rating of 2.34. Difficulty in defining research questions is not so technical but some teachers get confused of how to word it, so designing the exact wording for the research question makes it 'not so easy' for the science teachers.

In Item 2B, **writing the literature review** is the next action research component. It cracks the skills of the respondents in finding resources with reasons such as "I find it difficult to search for sources of literature review" had a percentage rating of 8.43. Opposite of that is those who answer "I find it interesting to read so looking for sources and literature review is easy for me" got a percentage rating of 5.22. A percentage rating of 4.82 was calculated for those who answer that "I easily get tired of reading so I find it difficult to write literature". For those who have access to different online libraries and make it easier

for literature review, the option got a rating of 0.80. Other answers were, "I find it interesting to read but I don't have time" and "I don't have enough time". Their answers had a rating of 0.80 as well. This suggests that only few of the respondents have the ease in literature writing. Generally, writing a literature review with a mean of 2.32 was "not so easy" for the respondents. It implies that some science teachers find it not so easy to look for resources, such as articles especially the current ones. In some cases, some teachers lack skills on finding reliable sources for their study.

The third component listed was **developing and writing methodology.** In item 3B, most of the responses claimed that there will be an ease of developing and writing research methodology if given enough time and resources. That reason obtained a percentage rating of 8.43. Reasons such as "having no enough knowledge in developing and writing research methodology " and "do not know the technicalities of developing and writing research methodology" got a rating of 4.02 and 3.21 respectively. A group of respondents believed in a collaborative effort; thus, they assumed that they can work on methodology if working with colleagues. This reason had a percentage rating of 3.21. Other reasons include "Computerized work is my problem", and "I get confused about what methodology to use" received 1.20 ratings.

Generally, an overall mean of 2.46 for developing and writing a research methodology was obtained. This was the highest among the research components with "not so easy" level of difficulties. This implies that more science teachers find developing and writing research methodology a bit difficult than defining a research problem as well as writing a literature review and organizing the findings. It implies that it's not that easy for

science teachers to decide when and where to fit everything. More examples or exposure to models could be the key to resolving this problem.

Analyzing data, the fourth component was perceived as “difficult” by the respondents with a mean score of 2.54. An item that had a percentage rating of 10.44 was the lack of statistical understanding that made the analysis complicated. This is where science teachers most frequently commented. Working with graphs and tables were enjoyed by some respondents. With this, they claimed that they can present and analyze data easier consistent with a rating of 4.02. Among the responses, a 2.81 percentage rating admitted that it is most difficult to analyze data in action research. “Friends that could help working with data analysis will make it easier working with it” response had a 2.01 rating. However, there was 0.80 percentage rating that expressed "gathering data is difficult” and “I don’t have enough time.” Analyzing data was the only component of action research that was perceived difficult by the respondents. Data analysis become so technical because of statistics, more teachers admitted that lack of statistical understanding is their problem. It implies that more science teachers are not well good enough in statistical treatment of their research study.

Item **5B, organizing and writing findings,** shows that the reason “Given a complete data I can organize and write the findings easily”, got a percentage rating of 7.23. On the other hand, a 6.43 rating was given to the answer “I am confused on what to use in order to organize and write findings.” Likewise, the answer “Given a good model to use, I can finish organizing and writing the findings of my study”, gathered a 5.62 rating. Only 0.40 percent admitted that "he doesn’t know how to organize and write findings". Another answer got 0.40 percentage rating which is the reason “I don’t have enough time.” This

generally implies that a 2.34 mean for organizing and writing the findings is also not so easy for the teacher respondents. Collecting the large amount of data, putting them together and writing the findings, made it not so easy for some teachers. The time element is also a big factor for some teachers.

According to the mean scores, teachers found writing literature review as the least difficult step and analyzing data as the most difficult step in the action research process.

Research Question No.4 What are the science teachers' perceptions of the value of action research to teaching and learning process?

The data to answer this research question is given in table 9 and 10 under the science teachers' challenges in doing action research. The discussion for table 9 also includes comments and ideas of teachers gathered from an informal interview about the view and perception of teachers in action research.

Table 9

Science Teachers Challenges in Doing Action Research (Teachers' Perception of the Value of Action Research in Teaching and Learning Process)

Statements	Strongly Disagree	Disagree	Agree	Strongly Agree	TOTAL
	f	*f*	*f*	*f*	*f*
1. Action research is valuable to the teaching and learning process for me as teacher.	0	2	24	24	50
2. Action research is valuable to the teaching and learning process for my students.	0	3	25	21	49
3. This action research project positively impacted my students learning.	0	5	29	16	50

4. This action research project positively impacted my teaching.	0	3	29	18	50
5. I view myself as a teacher-researcher.	1	10	27	12	50

Value of Action Research in Teaching and Learning Process	**MEAN**	**VERBAL INTERPRETATION**
1. Action research is valuable to the teaching and learning process for me as teacher.	3.44	Strongly Agree
2. Action research is valuable to the teaching and learning process for my students.	3.37	Strongly Agree
3. This action research project positively impacted my students learning.	3.22	Agree
4. This action research project positively impacted my teaching.	3.30	Strongly Agree
5. I view myself as a teacher-researcher.	3.00	Agree
OVERALL	3.27	Strongly Agree

Rating Scale	1.00 - 1.75	Strongly Disagree	1.76 - 2.50	Disagree	
	2.51 - 3.25	Agree	3.26 - 4.00	Strongly Agree	

Since the theme discussed the value of action research in teaching and learning process were also the themes gathered from the informal interview of the science teachers.

The responses gathered from the interview were also discussed below.

From table 9 the item number 1 with a statement "**action research is valuable to the teaching and learning process for me as a teacher**", had a mean of 3.44 which is interpreted as "Strongly Agree". There was a high level of positive agreement as shown in the 24 responses for "strongly agree" and another 24 for "agree" out of 50 responses, only 2 had a response of 'disagree". Some teachers' comments included "*I like action research,*

I know teachers and students can benefit from action research" "*Given enough time I can formulate a problem and conduct action research".*

This implies that science teachers perceive action research as a means to aid teachers in looking closer at their own teaching. In addition to that, action research is viewed as a kind of professional development tool in further enhancing the pedagogical system.

"**Action research is valuable to the teaching and learning process for my students"** had the highest mean of 3.37 evaluated as "Strongly Agree". There were 25 science teachers who chose "agree" and 21 chose "strongly agree". Only 3 teachers chose to disagree. One respondent commented that "*It's been a while since I am working with intervention in my class to meet the needs of my students not knowing it's already action research*" Another respondent said " *At first I thought it is just an additional tasks in my teaching load, but somehow it provides strategies in my teaching that can help my students to learn better*" This illustrates that action research can provide the best teaching for science teachers which in turn, will have an impact on the learning process of the students since they are the primary concern of the system.

Item number 3 was about the idea that "**action research project positively impacted the students learning**." Only 16 chosen "strongly agree" and 29 science teachers did "agree". Five (5) out of 50 science teachers disagreed with the idea. An overall mean of 3.22 indicated as "Agree". One teacher commented that "*My students enjoy learning with their classmates as part of the new strategy (the action research) I implemented in the class*" another teacher mentioned that "*I can see improvement in my class in lower section using the share and pair approach (action research)"* It implies that

science teachers believe that action research could lead to effective teaching and will have a greater influence in better learning process of the students.

A mean of 3.30 in item number 4 which was equivalent to “Strongly Agree" stated the idea that “**action research project positively impacted my teaching**”. A total of 29 science teachers “agree” and 18 science teachers “strongly agree” with the said response. *“I enjoyed doing it (action research) with my colleagues especially when other teachers are cooperating. We learned from each other”* This means that science teachers viewed action research as a positive influence not only towards learning but also in the teaching process.

Viewing teacher as researcher, which is item number 5, received the lowest mean of 3.00 equivalent to “Agree.” Twenty-seven (27) science teachers “agree” and 12 science teachers “strongly agree” with the idea. Ten (10) science teachers disagreed, and 1 strongly disagrees. Only a few teachers considered themselves as teacher-researcher. One teacher said, *“I don’t know action research but when they explained it to me, I can easily work on it. I can apply what I have learned in my masters’ class”* although that can be considered a positive response no one from the interviewee claimed that he/she can be viewed as a teacher researcher. One of the reasons might be some teachers are still new in the research process. On the other hand, some teachers have difficulties in doing other components of action research as reflected from table 8 which is about reasons indicating difficulties in the different stages of action research process.

In sum, the overall assessment of the value of the action research had a mean of 3.27 which is evaluated as “Strongly agree”. This manifests that teachers have a high positive perception on the value of action research in teaching and learning process.

Situational Reasons on the Challenges in Doing Action Research

There are other challenges in doing action research wherein some are situational. Five items from table 10 cite some situations about the respondents’ other related challenges encountered in doing action research. The discussion is given below.

Table 10

Situational Reasons on the Challenges in Doing Action Research Impact on Teaching Practices

Situational Reasons	***f***	**%**
1 .*Describe the long-lasting effects, if any, that you believe the action research project will have on your professional career?*		
a. The knowledge learned advanced an adjustment in planning to best meet the needs of the students.	9	3.61
b. It will have a long-lasting effect if you want to pursue the career of being a researcher or scientist in the future.	4	1.61
c. Action research project developed the ease to make adjustment to instruction, look at the content differently or utilize new instructional strategies.	29	11.65
d. Willingness to take the risks of trying different instructional methods.	5	2.01
e. Others please specify.* *It guides you somehow.*	1	0.40
2. In what ways has the action research experience empowered you and/or your teaching?		
a. It made me realized the impact of my teaching style to my students.	0	0.00

b. It made me more aware of my student's needs and made me more careful in analyzing my students work.	15	6.02
c. It appears to be a professional development opportunity that affects me in positive ways, including building confidence and autonomy.	12	4.84
d. It enhances the process of learning and it answers common problems concerning students' study habits and behavior.	22	8.84
e. Others please specify. * *A simple extra work.*	1	0.40
3. How has your action research helped you in your instructional practices?		
a. Action research helped me improve techniques /instructional strategies and focus on students difficulties.	23	9.24
b. Action research proved that using manipulative materials in teaching, help the students to understand the lesson more.	8	3.21
c. It developed creativity to use different assessment practices to know if students have a better understanding of the lesson.	16	6.43
d. I become more aware that teaching and learning could be fun.	3	1.20
e. Other please specify. * *It reflects my role as a teacher.*	1	0.40
4. What issues arose for you while engaging in action research and how did you resolve them?		
a. Time management, especially teachers are engaged with lots of clerical work and official time is not enough to work on action research.	31	12.45
b. Choosing the appropriate topic and determining the resources to be used.	12	4.85
c. Sustaining the interest while doing the action research.	4	1.61
d. Lack of knowledge in what statistical tool to be used.	3	1.20

e. Others please specify.	0	0.00
5. How did you resolve the issue chosen from number 4?		
a. We extend our time to work on action research.	16	6.43
b. We had brainstorming and collaborative effort within our colleagues.	24	9.64
c. Reminding each other about their assigned tasks.	3	1.20
d. Asking some authority (probably Mathematics teachers) regarding statistics.	6	2.41
e. Others please specify.* *Use the internet to seek for more information*	1	0.40

Table 10 presents other issues encountered by the teachers in doing action research. It clarifies the impact of action research on teaching practices. Item number 1 is about **the long lasting career impact**. The highest percentage rating of 11.65 was obtained on the response that "Action research project developed the ease to make an adjustment to instruction, look at the content differently or utilize new instructional strategies." It was followed by a response with a percentage rating of 3.61 wherein "the knowledge learned advanced an adjustment in planning to best meet the needs of the students." Another reason was "Willingness to take the risk of trying different instructional methods" got a rating of 2.01. A response on "It will have a long-lasting effect if you want to pursue your career of being a researcher or scientist", got a rating of 1.61. One teacher gave a reason on which is "it guides you somehow", with a percentage rating of 0.40. This item on situational reason implies that the teachers believe in the long lasting effect of action research - that is, more on instructional related and needs of the students.

Second on the list is the item about **confidence/empowerment impact.** A percentage rating of 8.84 was received by the response that “It enhances the process of learning and it answers common problems concerning students’ study habits and behavior.” A rating of 6.02 was received by the response, “It made me more aware of student’s need and made me more careful in analyzing my students work”. A 4.84 of the responses believed that “It appears to be professional development opportunity that affects teachers in positive ways, including building confidence and autonomy.” No one responded on the realization that action research impacts their teaching style to their students. Another response given was “a simple extra work,” with a percentage rating of 0.40. Thus, experience gained in writing action research empowers science teachers’ and their teaching styles by enhancing the learning process with much concerns of student’s need, study habits, and behavior.

Item number 3 is about **daily instructional impact**. A 9.24 percent of the responses were under the response that “Action research helped me improve techniques/ instructional strategies and focus on students difficulties.” A 6.43 percentage rating was received by the response “It developed creativity to use different assessment practices to know if students have a better understanding of the lesson.” The reason that “action research proved that manipulative materials help students to understand the lesson more" obtained 3.21 percentage ratings. A realization of “that teaching and learning could be fun" had 1.20 ratings. Another response was “It reflect my role as a teacher”. This implies that action research develops the creativity of teachers to use different assessments and instructional practices for the benefit of the students.

Issues engaged in action research and the process of solving it were put emphasis on item number 4. The 12. 45 percentage ratings got the highest that focuses on the impact of action research towards the teaching process. The issue on time management with a response “Choosing the appropriate topic and determining the resources to be used,” got 4.85 percentage ratings. The 1.61 ratings was for the reason that “Sustaining the interest while doing the action research,” and 1.20 percentage rating was for the “lack of knowledge in what statistical tool to be used.” The most frequently mentioned issue was time wherein science teachers believed that their official time is not enough to work on an action research because of other clerical works.

Item number 5 explores the **steps taken to resolve the issue stated in number 4**. With 9.64 ratings, some science teachers responded that having brainstorming and collaborative effort within colleagues can ease the difficulties on the issue of choosing an appropriate topic. This is also relevant in determining the resources to be used. "Extending time to work on action research" received 6.43 rating so as to resolve the issue on time management. “To ask for authorities especially in dealing with statistics” obtained 2.41 percentage ratings to bridge the gap on lack of knowledge in a statistical tool to use. “Reminding each other about the assigned tasks” gathered 1.20 ratings. It was also considered as a solution or step to resolve the issue on sustaining the interest while doing an action research. Another response that has 0.40 rating was to “Use the internet to seek for some information in doing action research". Hence, issues in number 4 item can be resolved through extending time and tapping other teachers and authorities to comply in finishing an action research project.

Abstraction/Synthesis

Throughout this chapter, the collected data has been analyzed and considered in the light of the research questions regarding the appraisal of science teachers' attitude, teaching efficacy and challenges in doing action research.

Data related to teachers' efficacy were explored to understand what factors contribute to teaching efficacy of science teachers. Before teachers seem to regress to the practices which they are most familiar and comfortable. But in today's generation of teachers, science teachers exhibit more effort, persistence, and positivity in regards to their work. As Woolfolk-Hoy, Hoy, & Kurz, 2008, p. 822) and Dellinger et al. (2008) defined *teacher efficacy* as "teachers' individual beliefs about their own abilities to successfully perform specific teaching and learning related tasks within the context of their own classrooms", that supports the results of the high teaching efficacy of science teachers. It also showed that science teachers' perceived efficacy is higher in student engagement that agrees in Woolfolk-Hoy et al. (2008) study. "When a teacher believes she or he has the capacity to organize and execute actions for a positive effect on student achievement, the teacher emphasizes academic achievement, and academic emphasis, in turn, reinforces a strong sense of teacher efficacy. Engaging with technology and trying new strategies lead to high efficacy level of science teachers that helped them to have a positive response to students' engagement, classroom management, and instructional practices.

In terms of science teachers' attitude in doing action research, it is evaluated only as slightly positive. As with regards to the study of Guskey, (2000) that determining teacher's attitude regarding professional development, specifically action research, is beneficial because a teacher's attitude will affect the implementation of the professional development experience. Therefore, there is an urge in understanding teacher attitudes

regarding the extent they are willing to implement changes in the classroom through action research. The attitude of teachers based on the study embraced three areas, perceived competence, organizational support and interest in action research. All of those areas received a slightly positive level of agreement. Findings revealed that some science teachers are not that competent in doing action research and that teachers only received a little support from the school administration. So developing teachers' deep interest in doing action research may take a while. However, in this study, science teachers' efficacy and attitude are not correlated with one another in doing action research. One is independent with another as to response with action research. It will not always follow that an efficient teacher has a positive attitude in doing action research and vice versa.

Science teachers value action research in their teaching and learning process. According to Parson and Brown (2002), the benefits of action research is that it leads to improvement of educational practices. Nevertheless, science teachers have difficulties in dealing with the stages of action research. Button (2000) found out that teachers perceived the action research process as time-consuming and overwhelming. That was reflected in the way teachers found data analysis stage as the most difficult step in doing action research process.

Implications

Participating in action research impact the teaching and learning process. The benefit of action research leads to the improvement of educational practice. Teachers need to learn how to conduct action research. School administration should motivate the teachers to actively participate in action research. Support of teachers is important, so they can have time to conduct research, gather and analyze data, and work with students. Time must be

given to teachers so that they can conduct action research. Teachers who learned and conduct action research develop more confidence in their work. Teachers conducting action research promote their own professional growth by reading education journals, books, and other resources as they try to accumulate knowledge about effective teaching practices.

Action research give teachers more confidence in their work, it can empower teachers to change by trying new things in the classroom and pushing them out of their comfort zone. So this study is an eye opener of what science teachers need in order to put teacher in many roles, such as teacher as researcher, a decision maker and an agent of change.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This part of the study reveals the significant findings, the conclusions drawn and the recommendations offered relative to the assessment of science teaching efficacy, attitude, and challenges in doing action research.

The research work aims to primarily assess the science teaching efficacy, attitude, and challenges in doing action research from the four big schools of DepEd Schools Division of Malabon City such as the Malabon National High School, Tinajeros National High School, Longos National High School and Potrero National High School.

The study utilized the mixed method- descriptive quantitative and qualitative method of research using the survey technique, as it is found to be more reliable and objective. Using statistics to generalize a finding, the data were gathered through questionnaires. The statistical tools used to treat the data were frequency, percentage rating, weighted mean, standard deviation, four-point Likert scale and Pearson r. There were sixty science junior high school teachers from the Division of Malabon City who were the respondents of the study.

SUMMARY OF FINDINGS

This part summarizes the findings for each of the problem posed earlier in this research.

1. The level of science teachers' perceived efficacy in science teaching got an overall mean of 3.40 interpreted as "a great deal" or high efficacy level.. This means that there is an ease

for the science teachers to handle the three correlated factors of the teacher efficacy scale: the students' engagement, classroom management and instructional practices.

Evaluation on science teachers' attitude in doing action research acquired a weighted mean of 2.98 as interpreted "slightly agree". This reveals that there is a slightly positive attitude among the science teachers in terms of their competence and interest in doing action research as well as in their perceived organizational support.

2. The relationship between teacher's efficacy in science teaching and attitude in doing action research was tested using Pearson r wherein the computed value of r was 0.0293. This is smaller than the probability value of at 0.05 level of significance of 0.839. Therefore, there is no significant relationship between the level of teaching efficacy in science teaching and attitude in doing action research. This means that changes in perceived teaching efficacy is not correlated with changes in the teachers' attitude in doing action research.

3. Overall results of the science teachers learning experiences in doing different stages of action research were "not so easy" as indicated by 2.40 mean. The trend on the level of difficulties in doing the stages of action research was revealed in this decreasing ranking, it is as follows: analyzing data > developing and writing research methodology> organizing and writing the findings, defining a research question> writing literature.

Reasons were offered which in turn, determines the difficulties of science teachers in doing action research. The first component, which is **defining the research question**, the reason that "*I can formulate research questions but get confused once in a while*," had a percentage rating of 12.85. This was considered as the highest among the items evaluated.

Overall, science teachers have little difficulties in defining the research question as indicated by “not so easy” remarks.

In **writing the literature review,** among the listed reasons, “*I find it difficult to search for sources of literature review*" had the highest percentage rating of 8.43. And the response that “ *I easily get tired, so I find it difficult to write literature*” got a 4.85 percentage rating Generally, writing a literature review with a mean of 2.32 was “not so easy” for the respondents.

The third component was **developing and writing methodology.** The highest response received was for the reason that “*there will be an ease of developing and writing research methodology when given enough time and resources*”. That reason obtained a percentage rating of 8.43.

Analyzing data was the only component perceived as “difficult” by the respondents with a mean score of 2.54. The item that garnered a percentage rating of 10.44 was their lack of statistical understanding that made the analysis complicated. This is where science teachers most frequently commented.

Item on **organizing and writing findings** yielded to a percentage rating of 7.23 for the reason "*Given a complete data, I can organize and write the findings easily*”. This generally implies that a 2.34 mean for organizing and writing the findings is also "not so easy" for the science teacher-respondents.

According to the mean scores in the science teachers learning experiences in doing the different stages of action research process, the least considered step in terms of difficulty is writing the literature review while the most considered step is analyzing data.

4. From table 9 the item about the response "*action research is valuable to the teaching and learning process for me as a teacher*" gathered a mean of 3.44 and was interpreted as "Strongly Agree". "*Action research is valuable to the teaching and learning process for my students*" had the highest mean of 3.37 evaluated as "Strongly agree".

A mean of 3.22 indicated as "Agree" was about the idea that "*action research project positively impacted the students learning*." A mean of 3.30 in item which was equivalent to "Strongly Agree" was the response that "*action research project positively impacted my teaching*". Viewing teacher as researcher was the item that received the lowest mean of 3.00 equivalent to "Agree." Overall assessment on the value of the action research got a mean of 3.27 which was evaluated as "Strongly agree".

Situational reasons on the challenges in doing action research were stated as:

1. **Long lasting career impact -** Action research project is viewed as a means to develop the ease in viewing the content in better perspective, using innovative instructional approaches or adjusting the instruction suitable for the learners. This got the highest percentage rating of 11.65.

2. **Confidence /empowerment impact -** A percentage rating of 8.84 was received by the response that "It enhances the process of learning and it answers common problems concerning students' study habits and behavior."

3. **Daily instructional impact -** 9.24 percent of the responses was under the response that "Action research helped me improve techniques/ instructional strategies and focus on students' difficulties."

4**. Issues while engaging in action research and how to resolve the issues while engaging in action research** and;

5. **Steps taken to resolve the issues while engaging in action research**

A 9.64 ratings were given by some science teachers towards the choice of having brainstorming and collaborative effort within colleagues as a means of resolving the issues in doing action research. This is to ease the difficulties on the issue on choosing appropriate topic and determining the resources to be used. Extending time to work on action research received 6.43 rating so as to resolve the issue on time management.

"*To ask for authorities especially in dealing with statistics*" obtained a 2.41 percentage ratings to bridge the gap on lack of knowledge in what statistical tool to use. "*Reminding each other about the assigned tasks*" gathered a 1.20 ratings. It is also considered as solution or step to resolve the issue on sustaining the interest while doing an action research.

CONCLUSIONS

This purpose of this paper is to assess the science teachers' attitude, teaching efficacy and challenges in doing action research from the four big schools in the Division of Malabon during the school year 2016-2017. Various conclusions were made as revealed by the significant findings and data analysis.

1. The level of science teachers' perceived efficacy in science teaching is of "a great deal" which means that the science teachers have high efficacy level, that they can handle students' engagement, instructional practices and classroom management positively. The level of science teachers' attitude in doing action research is "slightly agree" which implies that science teachers perceived competence, interest and perceived organizational support are considered slightly positive, that there is

still room for science teachers to abreast with advantages of doing action research in the teaching and learning process.

2. The result from this paper did not establish any correlation between teaching efficacy in science and attitude in doing action research. Thus, highly effective teachers do not necessarily mean to exhibit positive attitude towards action research. Likewise, teachers who are low in efficacy does not really imply to embrace negative attitude towards action research. So, a teacher with high perceived teaching efficacy can also have a positive or negative attitude in doing action research and vice versa.
3. Science teachers' learning experiences in doing different stages of action research were “not so easy” or slightly positive. The difficulties of science teachers in doing the stages of action research revealed more on analyzing data and in developing and writing research methodology. Problems encountered by the science teachers were- getting confused in writing research questions, finding it difficult to search for sources of literature review, lack of time and resources in developing and writing research methodology. Other problems noted were lack of statistical understanding that made the analysis complicated and having an incomplete data to organize and to write the findings easily. That denotes that science teachers still need to be oriented in doing the different stages of action research especially in the statistical and the technical part of the action research.
4. Science teachers have high positive perception on the value of action research in teaching and learning process. Action research impact teachers’ practices, first as a long lasting career impact – action research project developed the ease in viewing

the content in better perspective, using innovative instructional approaches or adjusting the instruction suitable for the learners. Second it develop science teachers' confidence and empowerment. It enhances the process of learning and it answers common problems concerning students' study habits and behavior. Lastly in the daily instructional impact- action research helped improve techniques/instructional strategies of science teachers so as to focus on students' difficulties.

RECOMMENDATIONS

Parallel to the abovementioned summary of findings and conclusions drawn, the following are the recommendations of the researcher as to how this study may be put to good use; how it may serve as a springboard for future studies; and as a stepping stone for the enhancement of existing programs, projects, and activities of the Department of Education - Schools Division of Malabon in terms of doing action research.

1. Science teachers' experiences in doing the different stages of action research revealed that science teachers need a professional advancement in doing the scientific paper on action research. This is especially needed in dealing with the statistical part and analysis of the study. Training program can be developed for them to perform the step by step stages and of the same time equipped teachers with the technicalities of doing action research. The output of this program is an action research that can be conducted in their respective schools. Seasoned teachers and teachers who did not continue or pursue graduate studies can be tapped to join the program.

2. Science teachers, value action research in the same way they put significance towards the total teaching - learning process; however, there are issues while engaging in action research. Having a Teachers' Quality Research Team (TQRT) is then recommended by the researcher. This is to have a team that will develop collaborative effort in doing and writing quality action research. Teachers' Quality Research Team (TQRT) should be primarily composed of science teachers - one of whom is good in statistics; one good in grammar; and one good in summing up ideas in addition to the science teachers who are involved in doing action research. The objective of the team is to assist one another in developing a good and quality action research where teachers and students will benefit from it.
3. A longitudinal study is recommended and potential research is to establish if teachers conduct personal action research even in the absent of incentive.
4. Bigger number of respondents is encouraged, and questionnaires should be tried in other division to validate the results of this study regarding the correlation of teaching efficacy and attitude in doing action research.

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EDUCATION

2007 — Certificate Program in Teaching Chemistry (CPT)
University of Santo Tomas

1992 — Bachelor of Science in Elementary and Secondary Education (BSESE) Major in General Science
Philippine Normal University

PROFESSIONAL EXPERIENCES

1996 June-Present — Malabon National High School
Grade 9 Science Teacher
Research Teacher

1995 June-1996 March — Computer Learning System Incorporated
Computer Education Teacher

1992 June-1995 March — St. Stephen's High School
Grade School Science Teacher

PROFESSIONAL LICENSES

1992 — Professional Board Examination for Teachers
1992 — Career Service Professional Examination
1991 — Career Service Sub-Professional Examination

PROFESSIONAL ACHIEVEMENT

NATIONAL LEVEL

February 3-5, 2010 — *Trainer*
National Qualifier Science Investigatory Project Competition
7th National Science Quest
Tabacco National High School, Legaspi City

February 9-11, 2007 — *Trainer*

	5th placer Investigatory Project Life Science (Individual Category) 4th ASEP National Science Fair Quiz and Sci- Dama Competition Baguio City.
REGIONAL LEVEL	
November 8, 2014	*Trainer* 4th place Winner Science Investigatory Project Competition Regional Science and Technology Fair Navotas High School , Navotas City
May 23, 2014	*Demonstration Teacher* Regional Training of Grade 9 Teachers in K12 Curriculum - Philippine Normal University Taft Avenue, Manila
October 19, 2013	*Trainer* 2nd place Winner of Science Investigatory Project Competition Regional Science Quest Benigno "Ninoy" Aquino High School Makati City
November 19-20, 2009	*Trainer* 3rd place Winner of Science Investigatory Project Competition Regional Science Quest Gen. T de Leon National High School Valenzuela City
August 21, 2008	*Official Representative* *"Regional Search for Outstanding Science Club Advisers of the Philippines"* Division Of Malabon and Navotas
December 7- 8, 2006	*Trainer* 2nd placer Investigatory Projects Life Science (Individual Category) 2006 DepEd INTEL Philippines Science Fair University Of the East, Caloocan City 3rd placer Investigatory Project Physical Science (Individual Category) 2006 DepEd INTEL Philippines Science Fair University Of the East, Caloocan City
January 26-27, 2006	*Trainer* 3rd placer Sci-Dama Competition Third Year Level 3rd Regional Science Quizbee and Sci-Dama -Bago Bantay Elementary School Quezon City
DIVISION LEVEL	
October 8, 2016	*Teacher Category* 2nd Place Winner-Strategic Intervention Materials(SIM)

	Division Science and Technology Fair Malabon National High School- Malabon City
October 8, 2016	*Trainer* 3rd Place Winner-Science Investigatory Project (SIP) Division Science and Technology Fair Malabon National High School - Malabon City
September 30, 2015	*Resource Speaker* Division Wide Competency Enhancement Program On subject Contents and Pedagogies for all Teachers Tinajeros National High School- Malabon City
October 26-28, 2015	*Discussant* Training Workshop on Science Investigatory Project Malabon National High School- Malabon City
May 6-8, 2015	*Judge* Division Science Competitions Tinajeros National High School- Malabon City
October 7, 2015	*Judge* Strategic Intervention Material Secondary Level 2014 Division Science Quest Pasay City East High School- Pasay City
October 14, 2014	*Judge* 2014 Division Science Competitions Longos National High School- Malabon City
September 30, 2014	*Judge* Science Investigatory Project Contest 2014 Divivsion Science Competitions Division Office Conference Hall Longos, Malabon City
September 24, 2013	*Judge* Science Investigatory Project-Secondary Level Division Science Quest-Pasay City
September 10, 2012	*Trainer/ Adviser* Science Investigatory Project-First Place Division Science Quest 2012 Tugatog National High School Malabon City
September 10, 2012	*Judge* Science Investigatory Project Division Science Quest Tugatog National High School, Malabon City
October 15, 2011	*Trainer* First Place Science Quiz bee (Third Year) Division Science Quest 2011 Potrero National High School Malabon City

September 11, 2010	*Trainer* First Place Science Investigatory Project (Physical Team Category) 8th Division Science Quest Tinejeros National High School, Malabon City
September 24-25, 2008	*Judge*-Division Science Investigatory Project-Acacia Elementary School Acacia Malabon City
October 22-23,2009	*Trainer* 1st Place Winner of Science Investigatory Project Division Science Quest 2009 Panghulo National High School- Malabon City *Trainer* 2nd Place Winner of Sci-Dama Competition Fourth Year Level Division Science Quest Panghulo National High School- Malabon City 3rd Place Winner Sci-Dama Competition Third Year level - Division Science Quest- Panghulo National High School - Malabon City
December 6, 2006	*Trainer* First placer Science Quizbee Third Year Level Cluster I Division Science Fair and Quiz 2006 Longos National High School Malabon City
December 6, 2006	*Trainer* First placer Sci-Dama Third Year Level Division Science Fair and Quiz 2006 Longos National High School -Malabon City
January 29-30, 2004	*Trainer* The Use of Computer Assisted Learning Division Echo Seminar on Improvisation Malabon National High School Operation and Handling of ScienceEquipment and Production of Computer Instructional Materials Malabon National High School- Malabon City
August 30, 2002	*Demonstration Teacher* Implementation Of Basic Education Curriculum Chemistry Subject Third Year Malabon National High School-Malabon City
October-November 2002	*Trainer* Basic Computer Skills Computer Literacy program For Teachers Malabon National High School Malabon City

April 29- May 3, 2002	*Demonstration Teacher* Implementation of Basic Education Curriculum In Science and Technology – Malabon National High School - Malabon City
May 25-30, 1998	*Trainer* Division Mass Training on the Use of Practical Work Approach in Teaching Science and Technology Computer Assisted Learning-Malabon National High School -Malabon City
SCHOOL LEVEL	
June 7-11, 2010	*Demonstration Teacher* SUMMER INSET for Teachers Malabon National High School, Malabon City
June 7-11, 2010	*Facilitator* SUMMER INSET for Teachers Malabon National High School, Malabon City
May 25-29, 2009	*Demonstration Teacher* SUMMER INSET for Teachers Malabon National High School, Malabon City
May 25-29, 2009	*Facilitator* SUMMER INSET for Teachers Malabon National High School, Malabon City
June 2006-March 2008	*Science Club Adviser* Malabon National High School, Hulong Duhat Malabon City
April 2, 2003	*Trainer* Investigatory Project 2002-2003 Intel Philippines Science Fair Malabon National High School Malabon City
December 15, 2004	*Special Award* Teacher's Day Celebration Malabon National High School- Malabon City
May 2, 2003	*Congressional Award Achievement* Malabon National High School- Malabon City
PROFESSIONAL DEVELOPMENT NATIONAL LEVEL	
August 6-8, 2007	Orientation /Training for Teachers of the S & T Oriented High Schools and Learning Centers- RELC- Marikina City

February 9-11, 2007	4th National Science Quiz, Science Fair and Sci-Dama, Baguio City
REGIONAL LEVEL	
April 22, 2016	Salinlahi Guro ng Siyensiya Philippine Science Heritage Center DOST Complex, Bicutan Taguig City
September 1, 2015	Hands On minds On Microscale Chemistry (Homomich) Quezon City Science Interactive Center Quezon City
September 8, 2014	Genomics and Bioinformation:Opening a New Era of Promising Application in Science- National Institute of Molecular Biology and Biotechnology (NIMBB) UP Diliman Quezon City
July 26, 2014	SySTEM Upgrade: A Teacher Training Program on Innovative and Strategic STEM Education Philippine Science High School Main Campus Diliman Quezon City
May 19-23, 201	Regional Training of Grade 9 Teachers: Science in the K12 Curriculum Philippine Normal University Taft Avenue, Manila
November 18, 2011	2011-2012 REGIONAL SCIENCE COMPETITIONS Upper Bicutan Elementary School Taguig City
December 7-8, 2006	2006 DepEd INTEL Philippines Science Fair University of the East Caloocan City
February 20-21, 2006	Training of Chemistry Teacher on the Use of CONSTEC VCDS and Teaching Support Materials University of the East Caloocan City
October 22, 2005	Seminar-WorkShop on SCI- DAMA Andres Bonifacio Integrated School City Of Mandaluyong
November 29-30 , 2004	Second Annual Convention of the Secondary Science Club Advisers Association Quezon City Science High School, Quezon City
November 20-21, 1997	Technological Creativity and Invention Development Seminar Workshop DOST Executive Lounge DOST Compound, Bicutan (16 hours)
October 9-27, 1997	Training Program on the Use of CAI in the Teaching of Science at High School Level Ramon Magsaysay High School(184 hrs) Cubao, Quezon City

August 23, 1997	Workshop in Microscale Chemistry for Teachers in Secondary Schools College of Education, UP Diliman Quezon City
May 16-22, 1994	Seminar Workshop on the Integration of Environmental Education in Science Teaching Philippine Normal University(56 hrs) Taft Avenue, Manila
June 18-19, 1994	Seminar Workshop on Instructional Materials Preparation in Environmental Education Integration (16 hr.) Philippine Normal University –Taft Avenue Manila
DIVISION LEVEL	
October 24-26, 2016	Division In Service Training for Teachers-Science MalabonNational High School – 24 hours Malabon City
October 23-24,2014	Division Enhancement Program in Science Tinajeros National High School-Tinajeros Malabon City
September 10,2012	DIVISION SCIENCE QUEST Tugatog National High School Malabon City
October 15,2011	9th DIVISION SCIENCE QUEST Potrero National High School Malabon City
September 11,2010	2010 DIVISION SCIENCE QUEST Tinajeros National High School Malabon City
September 17 and 24, 2005	Division Seminar Workshop in Science Teaching Malabon National High School- Malabon City
February 28, 2003	Division Science Quiz Bee -Malabon National High School-Malabon City
SCHOOL LEVEL	
October 14, 2016	School Learning Action Cell- " I Speak , You Assess" Malabon National High School
June 2, 2016	Brigada Eskwela 2016-Malabon National High School-Malabon city
January 29, 2016	School Learning Action Cell Tracking School Performance Malabon National High School- Malabon City
August 5-7, 2015	Echo Seminar For Testing Malabon National High School- Malabon City
October 9, 2014	Project S.M.I.L.E Teachers Quality Circles and Quipper School E-Learning

	Malabon National High School Auditorium, Malabon City
June 19, 2014	Results Based Performance Mangement System (RPMS) Training for Teachers- Malabon National High School- Malabon City
October 27-29, 2010	SEMBREAK INSET for TEACHERS Malabon National High School Malabon City
May 25-29, 2009	SUMMER INSET for Teachers Malabon National High School , Malabon City
October 22-26, 2007	Sembreak Inset for Teachers Malabon National High School- Malabon City
October 23, 25-27, 2006	Semestral Break INSET for Teachers Malabon National High School- Malabon City
October 23, 2006	Utilizing Portable Devices in Achieving Effective Teaching and E-learning o Overhead and Slide projector o Television and Radio o Multimedia with the Use of Cellphone and Computer Malabon National High School- Malabon City
October 24-28,2005	In Service Training for Teachers Malabon National High School- Malabon City
May 30 and June 3,2005	Seminar Workshop of Constructing Classroom Test and Develop Intervention Materials for Succesful Teaching Malabon National High School- Malabon City
October 25-29, 2004	In Service Training for Teachers Malabon National High School-Malabon City
March 10-12, 2004	2004 Intel DOST-SEI Science Research Seminar Workshop Malabon National High School Malabon City
November 23, 2002	2001 Teacher Education Project Meralco Millenium Foundation Ortigas Center, Pasig City (48 Hours)
April 29-May 3,2002	Training Program for the Implementation of the Basic Education Curriculum - Malabon National High School Malabon City
August 24, 2000	Division Echo Seminar on Teacher Formation Program Malabon National High School Malabon City

August 29, 1998	DOST SEI Trainig Program in the Use of Laboratory Equipment in Chemistry for High School Level -Quezon City Science High School

COMMUNITY SERVICE

September 19, 2015	**Documentor** 30th International Coastal Clean up Pulo Tanza, Navotas City
January -December 2014	**Volunteer Contributor** Feeding Program Malabon National High School
April 2010- July 2011	**Volunteer Teacher**- Northville Mission Northville, Bayugo, Meycauayan, Bulacan
August 19, 2011	**Participant** Plant a Billion Trees Project MalabonNational High School- Malabon City
April 24- 25, 2010	**Participant** Ecomarino Camping 2010 Malabon National High School- Malabon City
July 31, 2010	**Project Coordinator** EnvironmentalAwareness and Tree Planting Activity Bayugo, Meycauayan, Bulacan

SKILLS AND AREAS OF EXPERTISE

- Knowledgeable in the use of technology (Microsoft Excel,Word, Power Point, Publisher, LCD projector)
- Highly interested in teaching and coaching students.
- Have passion in doing Science Investigatory Project and research
- Enthusiast in cooking and experimental recipe

REFERENCES

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