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Readiness for Effective Implementation of K to 12 Science Curriculum of Philippine Schools in Qatar

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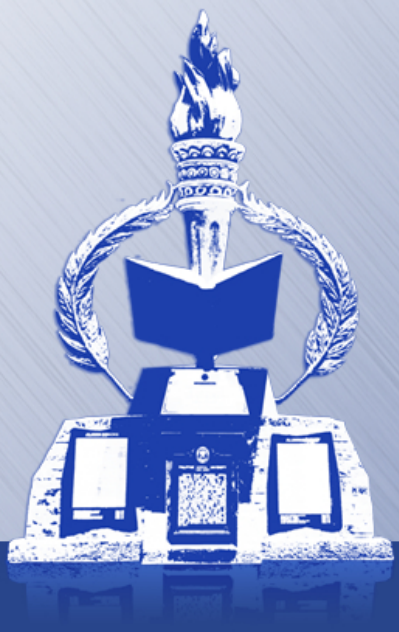

READINESS FOR EFFECTIVE IMPLEMENTATION OF K TO 12 SCIENCE CURRICULUM OF PHILIPPINE SCHOOLS IN QATAR

A THESIS

Presented to

The College of Graduate Studies and

Teacher Education Research

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In Partial Fulfillment

of the Requirements for the Degree

MASTER OF ARTS IN SCIENCE EDUCATION

with Specialization in Chemistry

MARY GLORACE I. JACOB

May 2016

APPROVAL SHEET

The thesis attached hereto, titled "**READINESS FOR EFFECTIVE IMPLEMENTATION OF K TO 12 SCIENCE CURRICULUM OF PHILIPPINE SCHOOLS IN QATAR"**, prepared and submitted by **MARY GLORACE I. JACOB** in partial fulfillment of the requirements for the degree **MASTER OF ARTS IN SCIENCE EDUCATION with specialization in Chemistry**, is hereby recommended for approval and acceptance.

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ABSTRACT

Name : Mary Glorace I. Jacob

Title : Readiness for Effective Implementation of K to 12 Science Curriculum of Philippine Schools in Qatar

Key Concept/s : Effective Implementation of K to 12 Science Curriculum

Degree : Master of Arts in Science Education

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Adviser/s : Dr. Antriman V. Orleans

The study investigates the readiness of Philippine schools in Qatar for effective implementation of K to 12 Science Curriculum in terms of six (6) domains, namely, physical facilities, instruction, content, support to students, library and instructional materials and administration. Two hundred seventy-seven (277) high school students of Philippine International School Qatar (PISQ) out of a population of 896; and 281 high school students of Philippine School Doha (PSD) out of a population of 948 enrolled during the school year 2015-2016 served as the student-respondents. All HS administrators and HS Science teachers of both schools also served as respondents. The student-participants were chosen through random sampling technique. The descriptive-survey research method with a five-point Likert scale divided into two parts: Part I-Respondent's Profile and Part II-Respondent's Perception, was employed. The data gathered in this study were treated statistically with the use of frequency and percentage; and descriptive statistics such as mean and standard deviation. Major finding of the study reveals that

Philippine schools in Qatar are ready to effectively implement the K to 12 Science curriculum as perceived by their immediate stakeholders, but the high standard deviations of the responses suggest that improvements must be made on all areas with emphasis on physical facilities, and library and instructional materials.

DEDICATION

to

God, the almighty,

for the constant source of "everything"

my beloved family and

Apisah L. Mama

for the constant "support", "love"

and "prayer"

that motivates me to attain

"greater heights"

in life…

this thesis is for you…

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That in all things, God may be glorified!

Alhamdullilah!

M.G.I.J

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CHAPTER 1

The Problem and its Background

Introduction

According to the 2014 Survey on Overseas Filipinos by the Philippine Statistics Office (PSO) that was published May 2015, there were approximately 2.3 million Overseas Filipino Workers (OFW) who worked abroad. The majority of OFWs, 96%, had existing work contract and the remaining 4% were working overseas in the absence of contract. OFWs have to sacrifice being with their family in order to give them brighter future. However, many OFWs managed to get their wife/ husband and /or children to join them abroad so that the family, with emphasis on raising their children, will not be compromised. Along with the increasing number of Filipino families overseas, there is also a growing number of children of school age. Hence, many schools overseas with Philippine-based educational curriculum were established. Philippine Schools Overseas (PSOs) provides the educational needs of the children of OFWs. Also, they were established to communicate Filipino culture and heritage. In addition, PSOs keep the Filipino youth abreast with the Philippine educational system should they decide to return to their country. To standardize and regulate these schools, the Manual of Policies, Standards and Regulations for Philippine Schools Overseas was developed. Specifically, the policy-making body for PSOs is the Inter-Agency Committee on Philippine Schools Overseas (IACPSO) which is functioning along with other five (5) member-agencies; Department of Education (DepEd), Department of Foreign Affairs (DFA), Department of Labor and Employment (DOLE), Overseas Workers Welfare Administration (OWWA), and Commission on Filipinos Overseas (CFO).

PSOs are given permit by the DepEd with the requirement that they operate in strict compliance with the basic education curricula of Philippines. Since the Philippines made a major conversion to K to 12 Education in its educational system last 2011, PSOs have to make necessary changes to address the requirements of the new curriculum. Prior to K to 12 systems, children are not required to attend school and they only had 10 years of basic education: 6 years in elementary and 4 years in high school. This has always been seen as a disadvantage considering the fact that the Filipinos can compete in an increasingly global job market. Developed countries, according to the Department of Education's briefer "view the 10-year education cycle as insufficient". Moreover, the Southeast Asian Ministers of Education Organization – Innotech (SEAMEO-Innotech) found the previous 10-year educational cycle to be congested, with a 12-year curriculum squeezed into 10 years.

As a result, Filipino students have trailed behind students around the world in the areas of math, languages and science. Additionally, the low performance of Filipino students in the National Achievement Test (NAT) indicates the need for transformation and advancement on the country's education system. The DepEd seen the K to 12 system as a cure to the declining quality of the country's educational system, as pointed out in a discussion paper on the "Enhanced K to 12 Basic Education Program". The K to 12 system offered 12 years of basic education similar to other developed countries; and new academic curriculum. Now decongested, the new curriculum will give students ample time to master basic academic skills as well as to participate in co-curricular and community activities. Furthermore, the K to 12 Curriculum is tailored to enrich the students' knowledge and increase their skills for future employment after high school and/ or for tertiary education.

The new curriculum will also support college graduates seeking work abroad. Thus, the enhanced K to 12 Curriculum is designed to provide a holistic education for all.

Since its implementation, no study to date has explored the implementation of K to 12 Curriculum in Philippine schools overseas. Hence, this study was conducted with the purpose of determining the readiness for effective implementation of K to 12 Curriculum of Philippine schools in Qatar with emphasis on Science. The K to 12 Science Curriculum, aimed to develop the scientific literacy of the students with the vision of creating active citizens who are able to make relevant and useful decisions that can affect the social, environmental and health aspects of the society. As stated by Senator Juan Edgardo Angara in the article of Torregoza (2014), Math and Science remain to be the foundation of a "strong national economy". He also added that to encourage Filipino youth to pursue science related careers; improvement in science education must be made. However, the poor performance of the Filipino students was revealed in the 2003 Trends in International Mathematics and Science Study (TIMMS) which showed that the Philippines ranked 23rd out of the 25 participating countries in both math and science; and 43rd out of 46 countries in HS II Science (Pastrana, 2012). Educators and leaders stressed that the insufficient school teachers due to low salaries, inadequate science facilities and laboratories; and lack of classrooms and textbooks are the primary factors why the science competency of Filipino students had been lagging behind (Sarmiento, 2013). On the other hand, in the report of National Academy of Sciences (2016) in Washington, DC, it was stressed that highly competitive teachers, strong school administrators, involvement of parents and the community; a student-centered learning environment and instructional supervision for teachers are the key

characteristics of effective Science, Technology, Engineering and Mathematics (STEM) schools. Thus, this study explored the status of the Philippine schools in Qatar in terms of physical facilities, instruction, content, support to students, library and instructional materials; and administration as indicators of the effective implementation of K to 12 Science Curriculum.

Basically, the reason for doing research on the readiness for effective implementation of K to 12 Science Curriculum of Philippine schools in Qatar is to acquire information to provide readers with new insights and fresh ideas that will guide them (readers) to the successful implementation of the new curriculum. Understanding the perceived readiness of Philippine schools in Qatar of the different stakeholders would help in the formulation of plans and decisions; and device techniques and strategies that will revitalize the administration and instruction by the school administrators and faculty members, respectively.

Conceptual Framework

Offorma (2005) as cited by Soneye and Agbonluare (2013), viewed curriculum as a "planned learning experience" presented to the students in school. While, Soneye and Agbonluare perceived curriculum as "a vehicle through which education is attained". In a broader perspective, curriculum is not only a "what", a plan, or content, it is a vital mechanism to equip the individuals with skills and knowledge to prepare them become relevant and productive members of the society. This is clearly reflected in the K to 12 Science Curriculum, which aims to develop scientific literacy to prepare the Filipino youth to be informed and active citizens of the country who are able to make sound judgments

regarding applications of scientific knowledge that may have impacts on the social, health, or environmental aspects of the society.

Based on the K to 12 Science Curriculum Guide dated December 2013, the new curriculum is (1) contextualized/ globalized and enhanced, (2) used spiral progression approach, (3) standards/ competence-based and outcome-based, (4) equipped graduates with the 21st century skills; and (5) learner-centered and inquiry-based.

The K to 12 Science Curriculum is contextualized since examples and activities are based on local culture, history and reality. By providing learning experiences that are familiar with the students, the concepts being described will be easy to understand and the lessons will become relevant to the students. Additionally, the science curriculum encourages the preservation of the country's cultural heritage by promoting indigenous technology as link between science and technology. Globalization is another characteristic of the new curriculum since it does not only promote the application of scientific knowledge in local setting but also in global context whenever possible. It is also said to be "enhanced" since students obtain thorough knowledge, skills and attitude through link and uniformity across all levels and subjects.

Another highlight of the new curriculum is its spiral progression where lessons are discussed from the simplest concepts to more complex concepts through grade levels and requires a link to students' prior knowledge to ensure mastery of knowledge and skills after each level. In the old curriculum, science was taught using the discipline-based approach, wherein biology is taught in second year high school, chemistry in third year high school and physics in fourth year high school. In K to 12, these subjects are linked and incorporated

from grades 7 to 10. In addition, this feature establishes a meaningful understanding of application of science in real-life context since there is integration across science topics and other disciplines.

The assessment in the new curriculum is standards/ competence-based and outcome-based. The K to 12 Science Curriculum provides learners with competencies and standards that are tailored around the needs of the students and important in a knowledge-based society. Outcome-based assessment focuses on what is essential for the learners (Killen, 2005), thus the new curriculum equips learners with skills for higher education, employment and entrepreneurship.

Since the shift to the K to 12 Curriculum is a response to this fast-changing world, the new curriculum equips graduates with 21st century skills required in a highly competitive job market. Graduates of the new curriculum are expected to acquire (1) information, media and technology skills, (2) learning and innovation skills, (3) effective communication skills, and (4) life and career skills. These skills are important to produce students who are innovative and creative citizens, critical problem solvers, informed decision makers, responsible stewards of nature and effective communicators.

Lastly, the K to 12 Science Curriculum is learner-centered and inquiry-based. According to Bogdan (2011), a learner-centered environment motivates the students to be in-charge of their own learning and to be independent learners. On the other hand, inquiry-based instruction encourages the students to make meaning and build knowledge through the meaningful activities designed by the teachers (Hunt & Lasley II, 2010). The attainment

of scientific knowledge, process and skills, and values and attitudes in the new curriculum is facilitated by the following approaches: inquiry-based approach, science-technology-society approach, problem/ issue-based learning, contextual learning, and multi/ interdisciplinary approach.

No matter how comprehensive the curriculum is, its implementation is the most crucial stage that will make or break the curriculum. Implementation refers to "putting into effect a plan already mapped out" (Soneye & Agbonluare, 2013). Similarly, Carl (2009) defined implementation as the "application phase" of the core syllabi, every subject curriculum and every lesson unit/ lesson. Therefore, curriculum implementation is giving life to the outlined topics and planned learning experiences. Implementation involves the use of new materials, taking part in new activities and practices and, integrating new principles (Fullan, 2001).

Implementation alone is not enough to ensure that learning takes place, the different stakeholders/ implementers and other external factors support the effective implementation of the curriculum. Effective refers to the achievement of the desired goal or intended result. In the study, effective implementation of the curriculum implied a successful curriculum implementation.

According to UNESCO and International Bureau of Education (IBE) (n.d.), teacher training, the resources provided and the ways teachers are supervised are some of the components that belong to the broader system that influence the effective implementation of a developed curriculum. On the other hand, (1) science curriculum (nature of subject, existing curriculum form), (2) science teachers (professional background, science teachers'

cultivation and training), (3) science textbook and curriculum (science textbook, science experiment, and other curriculum content), and (4) teaching style and methods (science experiment and other teacher methods) were proposed by Fullan and Pomfret (1997) as indicators for curriculum implementation (Zhang, Fulmer, Liu, et. al., 2014). Similarly, Quinn, Schweingruber, and Keller (2012) emphasized that students' learning is dependent on what they are taught, which is related to the available instructional materials, school science standards, teachers' knowledge and teaching strategies; and the kinds of resources, time and space provided for the teachers. Therefore, all these components must work in a coherent way to carry out the new vision of the curriculum. This kind of system-wide consistency is easier said than done, yet it is fundamental to the success of standards-based science education (Quinn, Schweingruber & Keller, 2012).

In comparison, it is noteworthy to highlight some of the most notable states that have exhibited tremendous amount of success in their K to 12 Education. One example is Finland. Finland is currently ranked as the number one K to 12 Education system. Finnish students consistently have the highest scores in math, science, and reading. Finnish schools also have a very low-key model that allows students to learn at a more relaxed pace. There is only a half an hour of homework every night and students don't attend school full time like other school systems worldwide. The goal is for the student to feel like he or she is "at home". Students study in lounges with comfortable chairs and fireplaces. Also in Finland, teaching is a very sought after and a highly esteemed profession and teachers are allowed to do tasks outside of the prescribed curriculum. Thus, it is easy to understand why Finnish students are a cut above the rest. They have no restrictions placed on them and are allowed to do what

they wish. These kids actually want to learn, they know that they can learn in creative and engaging ways. They also know that they will not be subject to endless hours of homework and memorization. The Finnish K to 12 Education system does not believe that is the best way for kids to learn. For example, if a child really enjoys reading, he or she might read book after book all day long. Teachers believe that this particular child will not only have outstanding reading and comprehension scores, he or she will also enjoy learning about a wide array of topics.

Another example of countries that have been very successful with their respective K to 12 Education is China. Chinese students do not spend their days focusing on sports or socializing. Instead, they are completely dedicated to intellectual pursuits. China's students study rigorously and are even required to complete extra classes and tutoring. In fact, if a child shows particular promise in Math, parents would begin seeking out additional math tutoring. Another is the case of India, it can be said that India's K to 12 Education system is also on the rise. Most children in India already know what they want to be when they grow up by the time they are in first grade. They have already dedicated themselves to follow that career path. These kids are highly motivated and the interactive learning approach in their classrooms seem to be helping them retain information better than most. Teachers guide their students through the learning process with fun and creative activities rather than hours upon hours of notes and lectures. The same is true in the case of Japan, where the K to 12 Education system in Japan gears students toward university preparation. Kids in Japan know that in order for them to succeed they must have high test scores. Even those kids who choose to go to technical or trade schools still must ace rigorous entrance exams. A lot of parental

pressure is a key factor here as well. Japanese kids also have more than one teacher in each class and kids are encouraged to work through their studies without textbooks, calculators, etc. This gives them many different ways to solve problems. Lastly, Singapore is also worthy of emulation. The K to 12 Education system in Singapore is also a school system worth mention. Kids in Singapore begin attending school at the age of three. They attend preschool for three years which includes two years of Kindergarten. While this is not mandatory, more and more parents are enrolling their children at the age of three to ensure that their child has the right scores to get into more advanced programs. The goal for teachers in Singapore is to focus on each child's individual learning style and ability. This ensures automatic success for the child as he or she will be less likely to fall behind.

Having seen how other countries have fared with their respective K to 12 Program, it is deemed important to note how the Philippines lags behind many of its ASEAN counterparts especially in Math and Science Education. So what are the requirements for an effective implementation of a curricular reform? Schagen (2011) arrived with 8 factors supporting effective curriculum implementation after synthesizing different researches and evaluations of implementation of the New Zealand Curriculum. First is a good-starting point which is important as a foundation of schools readiness and to motivate the new or inexperienced leaders. Second is committed professional leadership, effective curriculum implementation will be impossible if the head is incompetent of executing supervisory functions such as hiring proficient teachers and staff, allocating time for different subjects in school, providing instructional materials and building an atmosphere contributing to effective instruction and learning. Third is effective school-wide involvement that could lead

to a better shared understanding of the school's curriculum at classroom level. Fourth is an action plan, if the school has defined activities and tasks to begin, has assigned people who are involved and has a specific timeline for accomplishment of each point, it will have a better chance of displaying progress towards implementation. Fifth is external support, which refers to varied resources, electronic and print, provided by the ministry or Department of Education. Sixth is wider consultation, which is not limited to seeking feedback from teachers and students for developing a vision, a set of values, key competencies, and assessment objectives but is also extended to the opinions and ideas from parents and other community groups. Seventh is student focus which involves updating students, asking them about teaching and learning, signifying that their perceptions are also important and that their voices had been considered in decision making. This also implies that the teachers are committed to student-centered strategies. And last is establishing formats and systems for planning, delivering and assessing the curriculum, as emphasized by Yeung, Lam, Leung & Lo (2012), "on-going cycles of planning, implementing and evaluating could be the solution to effective curriculum implementation".

At the classroom level, Hoover (2011) identified five essential components for effective curriculum implementation: (1) content and skills to be taught and assessed through research-based curricula, (2) evidence-based interventions used to teach content/skills, manage behavior and support differentiated instruction models, (3) instructional arrangements or settings in the classroom used to implement the research-based curriculum and evidence-based interventions in order to teach and assess content/skills, (4) overall classroom and instructional management, which includes addressing both academic and

behavior; aspects of teaching and learning; and (5) evaluation of progress to assess learners' growth toward achieving benchmarks and/or meeting supplemental needs. Hoover (2011) stressed that these five components must be regarded and executed in cohesive ways in the classroom to achieve effective curriculum implementation.

Moreover, Bybee (2002) opined that the objectives of the systematic curriculum reform can be achieved if science teachers will always bear in mind that: they have knowledge about powerful learning and this can be used to create effective curriculum materials and experiences; curriculum reform consists of the implementation of standards-based instructional materials and ongoing professional development; standards-based curriculum materials address standards not only for content, but also for teaching and professional development; they will better understand standards-based materials when they experience ongoing professional development; and the combination of effective curriculum implementation and transformative professional development yields powerful learning for all.

To identify the effectiveness, value and adequacy of a program as stated by Rossi and Freeman (1993) cited by Wang (2010), program evaluations are used. Evaluation documents the effectiveness and impact of a program by revealing areas that require change and improvement through systematic and careful collection and analysis of information (Wall, n.d.). Institutions/ institutional programs are accredited/ certified by using guidelines and criteria adopted by the certifying or accrediting organization to identify whether they serve their designated function and recognize issues that need to be addressed and fields that can be improved. This approach allows lay persons to give informed judgments on the

qualifications of individual personnel and quality of programs. Thus, this study adapted the components being used by the Accrediting Agency of Chartered Colleges and Universities in the Philippines (AACCUP) to come up with domains that served as indicators of an effective implementation of K to 12 Science Curriculum of Philippine schools in Qatar. The AACCUP Survey Instrument uses 10 components: (1) vision, mission goals and objectives, (2) faculty, (3) curriculum and instruction, (4) students, (5) research, (6) extension and community development, (7) library, (8) physical facilities, (9) laboratories and (10) administration, but the researcher made some modifications by merging or excluding some of the mentioned components to fit the purpose of the study. The students assessed the school's effectiveness in terms of (1) physical facilities, (2) instruction, (3) support to students, and (4) library and instructional materials. Aside from the four domains mentioned, content and administration were included in the areas evaluated by the faculty and administrators since they have the maturity and level of knowledge to assess these two areas.

Students, faculty and school administrators are considered not only as stakeholders as well as curriculum implementers. Stakeholders are institutions or persons that are involved in school curriculum and shape its implementation. The successful and effective implementation of the curriculum is determined by instructional leaders and teachers to a great degree (Carl, 2009). The school administrators are important because they formulate the schools' vision, mission, philosophy and objectives. They also provide management of teaching personnel and school program, keep records of curriculum and report learning outcomes. On the other hand, teachers are essential in curriculum implementation since they engage the students to different learning activities by designing, enriching and modifying

the curriculum to suit the individual needs of the learners. Lastly, the students are not only the primary stakeholders in the curriculum; they also make or unmake the curriculum by their active and direct participation.

Physical facilities are vital in the effective implementation of the curriculum, as they do not only house the learners but also serve as catalyst of the enhancement and development of the learners' talents, skills and potentials. Thus, establishment of secured, adequate and satisfactory educational school facilities has to be of major concern, specifically in terms of their formation, procurement, development, improvement, maintenance, records keeping and accountabilities. Educational facilities have to be adaptable to the various teaching methods and strategies as educational processes are moving toward more active, interrelated and interactive environment (Deped, 2010). In the 2010 Educational Facilities Manual released by the DepEd, the word "educational facilities" refers to all facilities that are located in the school grounds and inside the school buildings. Also, the terms educational school facilities, school plant, and physical facilities may be used interchangeably. In terms of Science teaching and learning, there should be adequate classrooms and laboratories with manageable class sizes; and sufficient and up-to-date educational resources such as laboratory equipment, apparatus, tools and chemicals/reagents (Ogunmande, 2015). Since physical facilities play a significant role in the teaching and learning process the school should make necessary improvement and upgrading to adhere with the requirements of the K to 12 Science Curriculum.

To assess and evaluate the implementation of science program of any school, the dimension and nature of science instruction should be taken into consideration. Although

the success of the curriculum depends on many factors, the teacher plays a vital role in bridging the gap between the curriculum set outcomes and the students' performance since they are the ones directly executing and translating the standards into observable and measurable evidences. In *Framework for Philippine Science Teacher Education* published in 2011 by the Science Education Institute, Department of Science and Technology (SEI-DOST) and the University of the Philippines National Institute for Science and Mathematics Education Development (UP NISMED), the qualities of effective science teachers have been grouped into three categories: professional knowledge, professional practice, and professional attributes. Professional knowledge includes knowledge of science content, knowledge of pedagogical content, knowledge of general pedagogy, and knowledge of the science curriculum. In addition to this, professional practice and professional attribute were also on the list. Professional practice, outlines what teachers are expected to do to achieve quality learning outcomes- the objective of science education. It also expects teachers to work with the learners, colleagues, parents and other community members to achieve this objective. While Professional attributes are those characteristics that enable teachers to embrace change to develop and improve teaching practice as well as sustain professional growth. Professional attributes include modeling scientific inquiry skills and scientific attitudes. These attributes include being reflective, committed to improvement, and becoming active members of their professional community. These qualities are considered to be standards of teachers and are not arranged hierarchically. This means that these are competency-based and do not depend on the length-of-teaching experience. Similarly, the report of the National Commission on Mathematics and Science Teaching for the 21st

century (NCMST, 2000) presents a vision of high quality teaching which are summarized as those wherein: teachers have an adequate knowledge of subject matter; encourage inquiry and hands-on approaches to learning for students; recognize individual students as learners and insist that students learn; have adequate skills of observation, information gathering, sorting, classifying, predicting, and testing; having the knowledge and skills of questioning and probing, and also reflective on their practices; build on learners' strengths rather than trying to stamp out their weaknesses; carefully and thoroughly align the curriculum with assessment practices, and high standards for student learning; have regular support and opportunities for professional learning, continuing education, and effective use of technology; teachers being recognized, valued and rewarded; and, teachers being evaluated based on performance and achievement of the students.

The content of the curriculum is also a fundamental factor in effective implementation of the new curriculum. The content should arm the students with 21st century skills to make them globally aware and competitive and to develop their innate talents and skills to become productive citizens. Science learning activities should also enhance self-confidence through group dynamics and promote the development of decision-making ability of the students to become life-long learners.

The support to students to meet their personal and academic needs is another significant factor in the successful implementation of the new curriculum. The students need organizations, trainings, and activities that will enhance and deepen their science skills. Educational field trips, symposia and workshops facilitated by professional lecturers should also be provided by the school since Science is learned best when it is personally seen and

experienced by the students. The school should also provide opportunities for students to join international science competitions and organizations as active participation to these activities will develop positive attitude towards science and may lead to the pursuance of science-related career in the future. However, the school should have adequate staff and equipment and clear policies and procedures in selecting students who will participate in science activities and programs so that all students have equal opportunities to be chosen.

In addition to knowledgeable teachers, library and instructional materials are also important in the successful implementation of the new curriculum since effective instruction needs well-designed instructional materials. Textbooks and other instructional materials should encourage the students to ask questions to elicit ideas, and should provide activities that connect students with the real life situations. Additionally, student instructional materials can also be useful to teachers (Davis and Krajcik, 2005), since these provide overview of key concepts, describe how concepts are planned to be developed in a unit, and emphasize how each task in the unit is expected and connect prior experiences of the students to help them identify key ideas. Since the K to 12 Science Curriculum emphasizes the use of evidence in supporting arguments or explanations during class discussion, the library should have various print and non-print, digital and electronic reference materials that can help learners in their science research and lessons.

The school's working conditions as well as the successful implementation of any curriculum cannot be realized without the commitment of the administrators. Superintendents, principals and special education administrators are key personnel in implementing the curriculum as well the realization of the lesson objectives each day. The

decisions that administrators make and how they make them have a direct impact on working conditions. Administrators must also be familiar with available resources to support the diverse needs of students, parents and staff and must know how to access additional support in order to ensure appropriate education for all students and support for teachers (DiPaola & Walther-Thomas, 2003). Without the support from the administrators, the students and teachers will not be able to meet the expected results of the new curriculum. It is always said, that the education of the child is a joint effort, hence it is necessary that the administration support the teachers and students to realize the goals of the curriculum and make the learning process effective.

A paradigm (see Figure 1) was constructed with the aid of the concepts discussed in this chapter. As can be seen in the figure, the primary goal is to assess the current implementation of K to 12 Science Curriculum of Philippine schools in Qatar which is at the heart and center of the framework. The K to 12 Science Curriculum is (1) contextualized/ globalized and enhanced, (2) used spiral progression approach, (3) standards/ competence-based and outcome-based, (4) equipped graduates with the 21st century skills; and (5) learner-centered and inquiry-based. These characteristics of the curriculum are carried out through the engagement and active participation of the students, faculty and administrators in the teaching and learning process, thus moving out from the center of the diagram are the immediate stakeholders. The outer ring provides the big picture view of the school that must be attended to by all stakeholders as they sustain and influence the effective implementation of the new curriculum. Six domains have been identified as significant in the effective curriculum implementation: (1) physical facilities, (2) instruction, (3) support to students,

(4) library and instructional materials, (5) content and (6) administration. The interrelationships among the six domains and the manner in which the stakeholders function together contribute directly to the effective implementation of the K to 12 Science Curriculum.

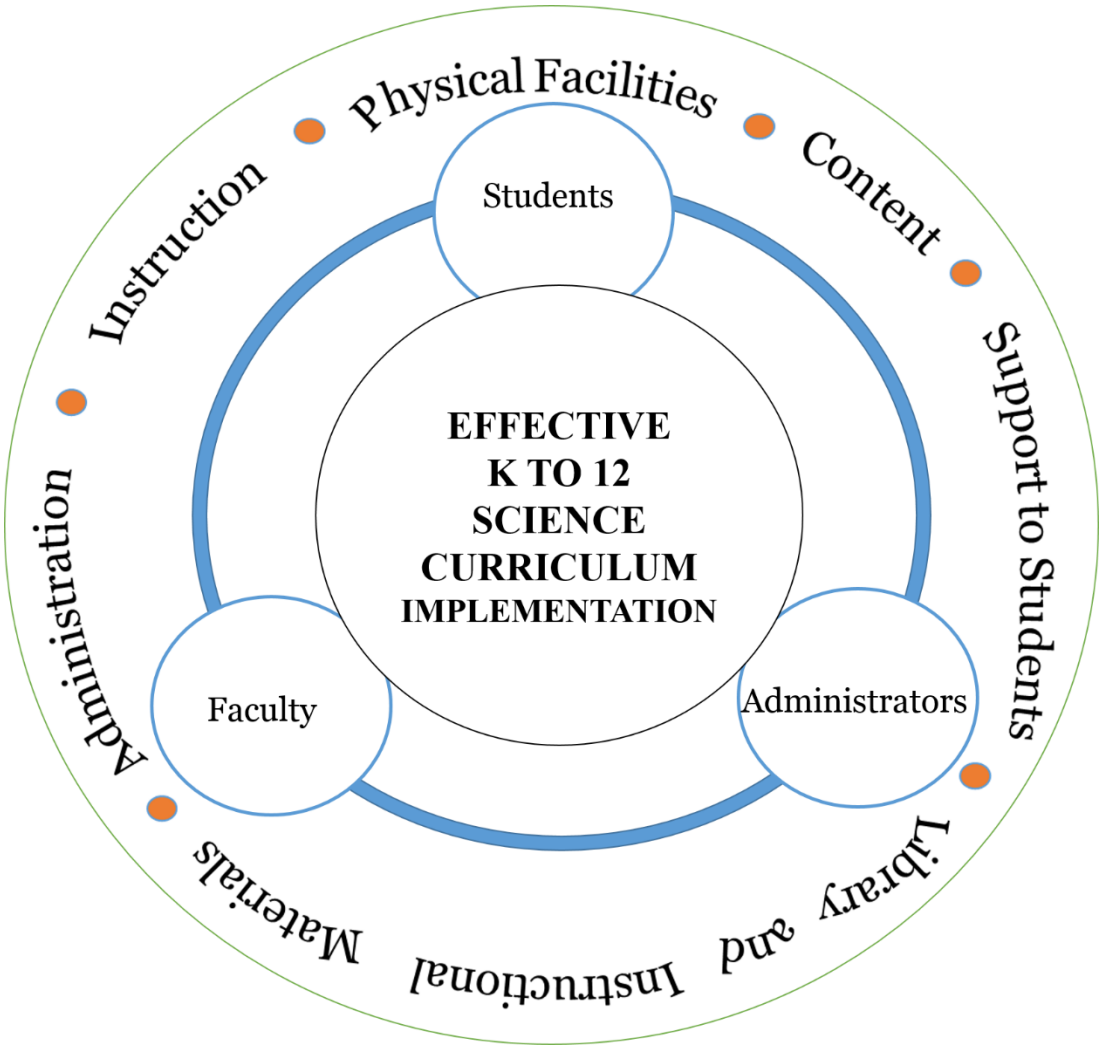

Figure 1. Conceptual framework of the six (6) domains as indicators of readiness of Philippine schools in Qatar for effective implementation of K to 12 Science Curriculum.

Research Problems

The main purpose of the study is to determine the readiness of Philippine schools in Qatar to effectively implement the K to 12 Science Curriculum. Specifically, it sought to answer the following questions:

1. How ready are the Philippine schools in Qatar in implementing the K to 12 Science Curriculum as perceived by the students, faculty and administrators in terms of the following domains:

a. Physical facilities;

b. Instruction;

c. Content;

d. Support to students;

e. Library and instructional materials; and

f. Administration?

2. What are the challenges being encountered by the Philippine schools in Qatar in implementing the K to 12 Science Curriculum in terms of the given domains?

3. What strategic plan can be developed to effectively implement the K to 12 Science Curriculum?

Significance of the Study

This study will be beneficial to the following:

The School Administrators. The results may serve as feedback on the quality of secondary science education. The findings will serve as bases for adopting new teaching

strategies and approaches that could be implemented to the school through the effort of the school heads of the Philippine schools in Qatar.

The Science Teachers. The result may provide them information on the quality of science education as perceived by the students. This will also give them information on the extent of effectiveness of science learning as provided in the curriculum. The study will allow them to revise their teaching approaches that will improve the quality of their instruction.

The Students. The result will make them aware of the different factors that determine effective Science instruction which will help them realize how K to 12 learning competencies in science can make them become more productive, maximize their achievement, and develop positive attitude toward science.

The Parents. The findings of the study will serve as guide to parents about the different aspects of science education and will encourage their great support and cooperation in making learning more relevant and practical in the lives of their children.

The DepEd. The result may serve as basis for better planning, policy formulation, implementation, monitoring and other forms of support mechanisms to overseas Philippine schools for the improvement of basic education especially with respect to the K to 12 Curriculum.

Limitations of the Study

The study was limited only to the determination of the readiness for effective implementation of the K to 12 Science Curriculum of Philippine schools in Qatar as

perceived by the school administrators, science teachers and students of PISQ and PSD during the academic school year 2015-2016.

The “administrators” referred to the high school department head of PISQ and PSD. The “faculty” referred to all the high school teachers that are teaching any science subject such as general science, biology, chemistry, physics and alike. The “students” referred to all high school students from grade 7 to grade 10, ages 10-17, enrolled during the academic school year 2015-2016.

The study included 277 students, 4 faculty-members and 1 administrator from PISQ. Likewise, 281 students, 4 faculty-members and 1 administrator from PSD were involved in the research.

The questionnaire that was used in the study was developed by the researcher and validated by experts. The readiness for effective implementation of the K to 12 Science Curriculum was measured by the students in terms of four (4) domains; physical facilities; instruction; support to students; and library and instructional materials. In addition to these four domains; content and administration; were included in the faculty and administrator survey form; a total of six (6) domains.

A major limitation of this study was that the readiness was only determined through a survey questionnaire. No interview, actual observation or review of school documents was conducted, thus the perspectives that were presented by the students, faculty and administrators may or may not be the accurate condition of Philippine schools in Qatar. Furthermore, only one administrator from each school represented the school administrators, and this may not honestly reveal the true picture of the situation at stake.

The schools that participated to the study were limited to Philippine schools located in Doha, State of Qatar.

The statistical tools used in the study were frequency and percentage; and descriptive statistics such as mean and standard deviation.

Definition of Terms

The following terms are defined either conceptually or operationally.

Administration- refers to organization and management; support systems and activities that enable the effective running of the school. It has 4 sub domains namely, academic administration; student administration; financial management and faculty administration. (Adapted and modified from AACCUP *Instruments,* 2014)

Content- refers to the lessons being taught in the school. (Adapted and modified from AACCUP *Instruments,* 2014)

Instruction- refers to the approaches, strategies, tools/ equipment and assessment method being utilized by the teacher during science teaching and learning process. It has 2 subdomains namely, teaching method and techniques; and assessment of academic performance. (Adapted and modified from AACCUP *Instruments,* 2014)

K to 12 Science Learning Competencies- refers to the learning competencies in science found in the K to 12 Curriculum Guide released by the Department of Education.

Library and instructional materials- refers to the print and non- print resources and equipment that are essential in assisting the teacher in conveying knowledge to the students. It has 3 subdomains namely, collection development, organization and

preservation; services and utilization; and physical set-up and facilities. (Adapted and modified from AACCUP *Instruments,* 2014)

Perception- refers to the views or opinions of the respondents on the effectiveness of the implementation of K to 12 Science Curriculum based on the different domains given.

Philippine School Overseas- refers to educational institution operating outside the Philippines, which may be fully or partly owned by Filipinos or managed and operated by Filipinos, and implementing the Philippine education curriculum with permit or recognition from the Department of Education (DepEd). (MPSR, 2015)

Physical Facilities- refers to the environmental factors that are constructed, designed, built, installed, etc. used to expand and accelerate the teaching and learning. It has 3 subdomains namely, Classrooms; Science Laboratories; and Equipment, Materials and Supplies. (Adapted and modified from AACCUP *Instruments,* 2014)

PISQ- refers to Philippine International School in Qatar. It is an educational institution that adopts the Philippine curriculum for pre-school, elementary and secondary education for children of Philippine expatriates. It is located at Ain Khalid, Doha, State of Qatar. (Retrieved from http://www.cfo-pso.org.ph)

PSD- refers to Philippine School Doha. It is a non-stock, non-profit educational corporation and is duly registered as the Philippine School in Doha, Inc. with the Securities and Exchange Commission. The school is situated at Old Murror, Al Messilah Area, Doha, Qatar. (Retrieved from http://www.cfopso.org.ph/schools/qatar/64philippineschooldoha. html)

Readiness- refers to the preparedness of Philippine schools in Qatar to effectively implement the K to 12 Science Curriculum.

Support to Students. It refers to any ways, means or effort of the school to strengthen the teaching and learning of science. It has 2 subdomains namely, student programs and services; and student development. (Adapted and modified from AACCUP *Instruments*, 2014)

CHAPTER 2

Review of Related Literature

This chapter sets the researcher's readings of the problem under study.

Teachers and the Curriculum

Though the success of the curriculum depends on many factors as discussed in Chapter 1, the teacher plays a vital role in bridging the gap between the curriculum set outcomes and the students' performance since they are the ones directly executing and translating the standards into observable and measurable evidences. In *Framework for Philippine Science Teacher Education* published in 2011 by the Science Education Institute, Department of Science and Technology (SEI-DOST) and the University of the Philippines National Institute for Science and Mathematics Education Development (UP NISMED), the qualities of effective science teachers have been grouped into three categories: professional knowledge, professional practice, and professional attributes. Professional knowledge includes knowledge of science content, knowledge of pedagogical content, knowledge of general pedagogy, and knowledge of the science curriculum. In addition to this, professional practice and professional attribute were also on the list. Professional practice, outlines what teachers are expected to do to achieve quality learning outcomes - the objective of science education. It also expects teachers to work with the learners, colleagues, parents and other community members to achieve this objective. While Professional attributes are those characteristics that enable teachers to embrace change to develop and improve teaching practice as well as sustain professional growth. Professional attributes include modeling

scientific inquiry skills and scientific attitudes. These attributes include being reflective, committed to improvement, and becoming active members of their professional community.

These qualities are considered to be standards of teachers and are not arranged hierarchically. This means that these are competency- based and do not depend on the length-of-teaching experience.

The above characteristics are similar to Bustos-Orosa (2008) model of critical factors in good teaching which she developed in her research on teachers' conceptions of good teaching with focus on teaching from elementary to college. She identified them as (1) personality-based dispositions, (2) teaching competency traits, (3) content mastery and expertise, and (4) pedagogical knowledge as characteristics of effective teaching.

Similarly, Woolnough (1994) gave three characteristics of a good science teacher for they play a significant role in the effective science teaching. According to him an effective science teacher is (a) competent and make their subject relevant, accessible and interesting for the students; (b) enthuse and like their own subject, and thus act as an inspiration and role model for many of their students; and (c) willing and able to build good relationships with their students; to be approachable, strict perhaps but not unfriendly and to sympathize with the difficulties and the needs that students might have.

The report of the National Commission on Mathematics and Science Teaching for the 21st century (NCMST, 2000) also presents a vision of high quality teaching which are summarized as those wherein: teachers have an adequate knowledge of subject matter; encourage inquiry and hands-on approaches to learning for students; recognize individual students as learners and insist that students learn; have adequate skills of observation,

information gathering, sorting, classifying, predicting, and testing; having the knowledge and skills of questioning and probing, and also reflective on their practices; build on learners' strengths rather than trying to stamp out their weaknesses; carefully and thoroughly align the curriculum with assessment practices, and high standards for student learning; have regular support and opportunities for professional learning, continuing education, and effective use of technology; teachers being recognized, valued and rewarded; and, teachers being evaluated based on performance and achievement of the students.

Although many researches showed that effective instruction requires skilled and knowledgeable teacher. Students are seen to be taught in a manner that will help them construct knowledge, pose appropriate questions, suggest alternative explanations, and propose additional inquiries by teachers with stronger content knowledge (Alonzo, 2002; Brickhouse, 1990; Cunningham, 1998; Gess-Newsome & Lederman, 1995; Lederman, 1999; Roehrig & Luft, 2004; Sanders, Borko, & Lockard, 1993).

In the research of Yabis (1993), he found out that teachers' competencies are affected by their personal and demographic attributes which includes their entrance qualifications and capacities such as scholastic rating and civil service eligibility; personal attributes such as sex and civil status; and academic experiences such as continuing professional development on the job. He stressed that all of these characteristics are the foundation of a personally satisfying professional life which will reflect to the satisfactory academic achievement of the students.

On the other hand, Navarro as cited by Ponciano (2004) identified academic competency as the major factor that enables teachers to perform their major objectives and

to design meaningful experiences suited to the needs, abilities and interest of the learners. For Navarro the "most important function of the teacher is to teach".

As the saying goes, "you cannot teach what you do not have", thus academic competency is vital to in the teaching and learning process. In the study of Decena (2013), she measured the readiness of the public secondary teachers to teach science concepts in the K to 12 Science Curriculum. Her study revealed that majority of the teachers had a very satisfactory rating in terms of their knowledge towards the 13 domains of the K to 12 Science Curriculum. However, she also found out that majority of the teachers need to develop their knowledge on the areas of biology, chemistry and physics.

Similarly, Weiss, Pasley, Smith, Banilower and Heck (2003) discovered in their classroom observations, interviews from teachers and teacher survey that the choice of strategies in K to 12 mathematics and science instruction is based on teacher knowledge, beliefs and experience (90%), class textbooks/ programs (71%), student characteristics (52%), district-provided professional development (31%), collegiality (18%), principal input (8%) and state/district standards/frameworks (5%) and accountability tests (7%). The findings suggest that there is a great need to empower the teachers through continuous professional studies and trainings since science instruction is greatly affected by teacher-related factors.

Science teachers require opportunities for ongoing learning—in disciplinary content and in content-specific pedagogy, like all professionals. The latter area, also called as pedagogical content knowledge, is getting rising attention, with the recognition that teachers must have an understanding that is further than knowledge of science content which include

knowing how students think about concepts, the questions teachers can ask to figure out what their students do and do not understand about a specific topic, and the activities they can give to help the student understanding progress. Improving the pedagogical and content knowledge can guide teachers in the planning and implementation of science activities and strategies to improve their instruction.

Bohn, Roehrig, and Pressley (2004) also discussed in their study that teachers who have more established routines and procedures at the beginning of the school year are more effective. This could be due to the fact that teachers who prepare and plan their teaching strategies and activates well offer more engaging and meaningful learning experiences to the students compared to teachers who have less or no preparation at all.

On the other hand, Buaraphan (2012) conducted a study in Thailand involving 830 students, 107 science teachers and 95 school administrators to identify their perceptions on desirable characteristics of science teachers for educational reform. His comparative method revealed that the respondents viewed a science teacher for educational reforms as one with good content and general knowledge, use hands-on activities, have good communication skill, polite and have sense of humor and honest, fair and compassionate.

Similarly, Liu and Meng (2009) summarized the students', teachers' and parents' perceptions of good teachers into four themes: teacher ethics, professional skills, professional development and students' test scores. Among the four, it was discovered that the research participants regarded teacher ethics as the most important. Therefore, aside from academic competency much is expected from the teachers' attitude and behavior which include being respectful, patient, humorous, and dedicated; strict with students; considerate

of and care about students; treat all students equally; grade fairly; maintain good relationship with students; and take responsibility for students' academic performance.

Also, Fabellar (2009) found out that the teachers qualifications and readiness were significantly related to the academic performance of pupils. Her study made use of descriptive nominative survey where she analyzed researches and documents of the pupil-respondents and interviewed teachers to determine their qualifications and readiness in teaching the pupils.

Furthermore, Ross, McDougall and Hogaboam-Gray (2002) found out in their review of different studies related to student outcomes and the difficulties in mathematics education reforms that there are many hindrances in implementing such reform which includes the delivery of instruction that the teachers did not experience when they were still students and the lack of teachers knowledge of the subject-matter.

It is vital that teachers have experienced effective science instruction so they have an understanding of key disciplinary content, which is crucial in guiding their students' learning. In addition, the more exposure to effective instruction the teachers have, traditional in nature as well as examples that are reform-oriented, the more likely they are to develop a vision of effective instruction.

The most important person in the curriculum implementation is the teacher. With their knowledge, experience and competencies, teachers are significant to any curriculum improvement. Teachers are responsible for introducing the curriculum in the classroom and making sure the skills and values are taught to the students. Even if the curriculum is regularly updated or even if the physical facilities are beyond the standard but if the teachers

are not competent to teach, then the rest of the domains are useless. The teacher also makes adjustments in all aspects of learning and makes sure that everybody understands the lesson. Teachers can make any lesson interesting and recommend materials to make the learning more meaningful and effective.

In the study of Abulon (2014), she explored the Manila public teachers' concept of effective teaching and found out that there is no single or predominant factor that affect effective teaching rather it is influenced by various factors such as dispositions, traits, knowledge and skills. Thus, the making of an effective instruction is complex since many factors related to teachers, school and students must work in coherent way to successfully increase students' achievement.

Aside from focusing on the development of the academic and pedagogical knowledge of the teachers, it is also important to improve the lot of the Science teacher. In fact, a shortage of good science teachers and low salaries may affect the progress of the new K to 12 Curriculum. More than just changing the curriculum, the government needs to invest in teachers and facilities to improve the competency of Filipino students and encourage them to enter science and technology professions, according to education reform advocates (Sarmiento, 2013).

Science Instruction

To assess and evaluate the implementation of science program of any school, the dimension and nature of science instruction should be taken into consideration. The value of the school regarding science is significant in the implementation of the program. Dobey (2004) identified four philosophies that could be used to assess and evaluate any science

program. First is his "all-or-nothing argument." In this philosophy, teachers have the tendency to provide students with too many information to memorize but there is a doubt regarding the retention and understanding of the material. He emphasized that in science, like any other areas, there is better learning if there are fewer topics that are discussed in great depth. Second is "content driven versus open-ended curriculum argument", the difference between efficiency of teaching and efficiency of learning and retention was discussed here. He stressed that sticking with the outline of important topics is vital, yet there should be flexibility and willingness to deviate from it to encourage creativity and interest of the students. The third is "textbook/ worksheet orientation versus free for all labs argument". According to Dobey, teachers put the blame to lack of time and equipment that they do not perform hands-on experiments. But the real reason is that teachers find the use of textbook safer, for they are afraid that students might ask questions regarding the experiment that they cannot answer accurately. Instead, he cited that this should not be a burden to the teachers as they can delegate such responsibility to students to enhance their analytical thinking while figuring out the answers. He also encouraged the teachers to allow the students to use laboratory equipment and apparatus since experimenting skills are important to science and can be used to new situations. Lastly is "content versus process versus attitude argument". He revealed that there is still a debate as to who believe in these three schools of thoughts. The teachers and parents believe that students should be taught "how science is done" by focusing on process and skills rather than specific facts. However, there are those who believe that inculcating positive attitude towards science is more vital than science facts or skills. On the other hand, there are proponents who would utilize facts

and concepts and strengthen the learning of the students with hands-on experiences to generate positive feeling towards science.

In the K to 12 Science Curriculum, teachers are expected to focus on student-centered strategies. The new curriculum incorporates constructivist ideas about learning, including student-centered pedagogy, active learning, and cooperative grouping structures, rather than more traditional, teacher-centered classroom discourse (Snow- Renner, 2001; Thompson, 2001).

In the *Review of the National Research Council's Framework for K-12 Science Education*, Gross (2011, p. 35) concluded that,

> *"This framework is important; it will be useful; parts of it epitomize good writing and sincerity, as well as scientific intelligence. It is an improvement on its national predecessors, albeit an evolution from them, not a revolution."*

The teachers therefore have to engage the students to meaningful activities not only aligned with the content of the curriculum but also in accordance to the needs and interests of the students. Murphy, Delli and Edwards (2004) concluded from the responses of the second graders, pre-service teachers and in-service teachers who participated in their study that an effective science teacher employs learner-centered strategies so learning takes place while students are happy. This could be due to the fact that some student-centered strategies like drama, field trip, projects, role play, games and cooperative learning expose students to real life experiences developing their self-confidence, creativity, communication skills and socialization skills (Küçükahmet, 2001; Sağlam,2005; Savaş, 2007).

Student-centered strategies do not only make the learning enjoyable to the students, inquiry and problem-solving also develop students' critical and creative thinking skills, analyzing and evaluating (MNE, 2006, p.13, Branch & Solowan, 2003; Sönmez, 2008).

Although the use of student-centered teaching strategies offers many advantages, they also possess some limitations. First, for student-centered strategies to be effective, teachers have to be creative so that they will not be using the same activities or techniques in every lesson (Glickman, 1991). Second, there are student-centered strategies specifically field trip, role play and problem-solving that are time consuming and require careful planning and execution. And third, the use of student-centered strategies can possibly become pointless if the activity is not appropriate to the lesson or if the execution is not properly managed (Küçükahmet, 2001; Sağlam, 2005; Savaş, 2007; Sönmez, 2008). Thus, along with the effort of establishing a student-centered learning environment, comes the consideration of other factors such as "teacher's familiarity with the strategy, time and physical facilities, financial cost, size of the student group, characteristics of the topic, qualities that the students expected to develop and classroom atmosphere" (Küçükahmet, 2001).

Another salient feature of the K to 12 Science Curriculum is the emphasis on the use of inquiry-based approaches to develop scientifically and technologically literate persons. Through scientific inquiry, students acquire broad knowledge and understandings of the processes and nature of science (Bell et al., 2003, Germann, Haskins & Ausl,1996).

According to the National Science Education Standards (NSES):

> *"Scientific literacy means that a person can ask, find, or determine answers to questions derived from curiosity about everyday experiences. It means that a person*

> *has the ability to describe, explain, and predict natural phenomena. Scientific literacy entails being able to read with understanding articles about science in the popular press and to engage in social conversation about the validity of conclusions. Scientific literacy implies that a person can identify scientific issues underlying national and local decisions and express positions that are scientifically and technologically informed. A literate citizen should be able to evaluate the quality of scientific information on the basis of its source and the methods used to generate it. Scientific literacy also implies the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately." (National Research Council, 1996, p. 22)*

In addition to the traits above, according to the National Science Teachers Association (1982), a scientifically literate person has to recognize both the restrictions and the importance of science and technology. Also, he or she needs to acknowledge sources of scientific and technological information and how to apply this information to arrive with a right decision (BouJaoude, 2002).

The 1990 UNESCO World Conference on Education for All maintains that science education should aim at forming a world community which consists of scientifically and technologically literate citizens (UNESCO, 1999; see also Donnelly, Jenkins & Layton, 1994).This is clearly reflected in the K to 12 Science Curriculum Guide dated December 2013, which aims to develop scientific literacy to prepare the Filipino youth to be informed and active citizens of the country to make sound judgments regarding applications of scientific knowledge that may have impacts on the social, health, or environmental aspects of the society.

In effect, there should be a re-tooling that is indeed necessary to further enhance K to 12 Science courses. In fact, a study in the US entitled *Preparing K-12 Teachers to Teach Inquiry-Based Science* shows that today's K to 12 science education places too much emphasis on discrete facts and offers too few opportunities for students to experience

discovery first-hand, according to a report by the National Research Council (NRC). In this regard, the NRC calls an inquiry-based approach an "essential element" of any science curriculum. It is through inquiry approach in science teaching and learning that students are given the opportunity to investigate, generate, ask authentic questions and construct reasonable explanations (NRC, 1996). Edwards (1997) added that students are being empowered by inquiry instruction for they are given the freedom to formulate their own questions, devise ways to answer them through data collection and analysis and then determine the reliability of the knowledge acquired.

In the study of Lott (1983), he analyzed 39 studies related to expository and inquiry-oriented approaches in science and he discovered that students exposed in inquiry approaches perform higher-level cognitive processes better as compared to those students whose teacher is using traditional approaches. Therefore, the development of higher-level cognitive skills among students is achieved by inquiry-based approach. This could be due to the fact that inquiry-oriented teaching teachers are inspiring the students to participate in activities that involve real life situations or problems that will motivate them to think, question and discuss possible solutions to the given situations (Lawson, 1995). Additionally, an inquiry-oriented learning environment involves investigation, comprehension and communication as students are "working scientifically" (Hackling & Fairbrother, 1996; Queensland School Curriculum Council, 1999).

Colburn (2000) and Hackling and Fairbrother (1996), classified inquiry-based teaching and learning approach into three levels: structured inquiry, guided inquiry and open inquiry. In structured inquiry the teacher provides procedures, materials, what to observe

and data to collect during activities but still giving the students the freedom to make their own discovery and conclusion based from the data collected. On the other hand, in guided inquiry the students create their own procedures to answer the given problems since the teacher only provides materials and problems to be solved. Open inquiry is similar to guided inquiry but it is only the responsibility of the students to identify problems that they want to investigate.

Despite of the positive effect of inquiry-based approach to students performance and achievement, the teachers struggle to adapt inquiry-based approach during classroom instruction and still tend to use traditional teaching and learning approaches in science (Chang & Mao, 1998; Kaiser, 1996; Lott, 1983). Ajewole (1994) found out that in Nigeria, teachers rarely apply inquiry-based strategies during science instruction due to lack of resources even though the use of inquiry teaching and learning approaches was emphasized in their National Policy on Education (FGN, 1998).

Similarly, Adams, Brower, Hill and Marshall (2000) conducted a survey from mathematics and science teachers in grades 4-8 of four Texas regions which indicated that hands-on activities, problem-solving activities and technology integration are all features of an ideal classroom. However, the interview from the respondents revealed that what they are using in everyday instruction are still the more traditional strategies and they seldom perform inquiry and experimental activities. This is not different from the Filipino teachers as they believe in the strength of the new science curriculum but they struggle in shifting from more teacher-dominated classroom to student-centered and inquiry-oriented learning environment. According to Yager (1991), "most teachers know that inquiry is something

that real scientists do, something that reformers have championed throughout their professional lives. And yet it remains something elusive; something that is poorly defined, something so broad that all can truthfully say they are doing some of it" (p. 3).

Teachers are discouraged to use inquiry-based approach due to broad scope of the science curriculum and emphasis on quantity of content coverage (Ogunbowale, 2001). These constraints are eliminated in the K to 12 Science Curriculum since it has fewer topics to cover which can also increase the students' performance for "when teachers teach less content, they teach it better by introducing ideas in a variety of ways and thus encourage students' learning" (Rutherford & Ahlgren, 1990; Wenning, 1997).

Another importance of updating the *contents* of the subjects is to keep abreast with the changing world. What is applicable ten years ago may already be obsolete and inappropriate at present; that is why modifying the curriculum is needed in all subjects. Computer, being an important part of the world today, should be embedded in the teaching of different subjects. Blending traditional and modern formats, merging lesson plans and activities are all given consideration in the teaching and learning process.

In the paper of Ferido (n.d.), *The Spiral Progression Approach in Science,* she makes mention of a Spiral Progression model in teaching science within the K to 12 formula. The scope and sequence of the content are developed such that concepts and skills are revisited at each grade level with increasing depth. Spiral progression approach as more facts and principles on each topic are encountered, the understanding grows in breadth and depth, creating a metaphorical spiral.

Changes in the teaching approaches are meaningless without the change in the assessment. The new curriculum used standards-based and outcome-based assessment approach since the content standards, performance standards and learning competencies specified in the K to 12 Science Curriculum cannot be solely assessed by using pen and paper types of tests. Therefore, the teachers have to use a wide variety of assessment techniques like performance assessment, portfolio, concept map, structured grid, diagnostic branched tree, word association, project, drama, interview, written report, demonstration, group/ peer assessment and self-assessment. In short teachers have to use alternative assessment and performance assessment techniques because paper-and-pencil tests cannot measure performance skills.

Popham (2006) explained that traditional approaches measure the students' learning as assessment *of* learning, while alternative assessment and performance assessment techniques treat the students' achievement as assessment *for* learning. This is similar to the Bekiroğlu (2008) concept, according to him traditional assessment techniques give information about students' outcome of learning, whereas alternative techniques also tells the teacher how much learning the students still need because the focus of the assessment is "what students don't know".

Major advantages of alternative and performance assessment include the evaluation of complex learning outcomes, measurement of reasoning and physical skills; and establishment of more meaningful learning as students are given the opportunity to work on real life scenarios (Gronlund, 2006). Furthermore, alternative assessment is a respond to the changes in educational perspectives which put high importance to higher-order thinking,

reasoning, problem solving, and conceptual understanding of scientific knowledge (Bekiroğlu, 2008).

Even though alternative assessment offers many advantages, there are still disadvantages like administration and scoring can be time consuming, grading can be subjective and demanding; and implementation must be done individually and frequently (Gronlund, 2006).

These constraints do not dismiss the fact that assessment and education go hand in hand, but students' performance in the exams should not only be seen as a student's number of correct answers but should be treated as qualitative change in a student's conceptions (Al-Sadaawi, 2007). However, the interview of Chance and Anderson (2003) to teachers and principals revealed that teachers are more focused on recording the standards or results of exams than using the results of assessment to change their instruction. It was also discovered that the standards set in the curriculum is seen more by the principals than the teachers as highly influential in helping teachers develop effective teaching strategies, and providing common expectations for all students. It is therefore important to re-orient the teachers of the main purpose of assessment and how they can use students' scores in improving their instruction rather than simply recording them for the purpose of grading or ranking the students.

Educational Facilities/ Resources and the Curriculum

In the 2010 Educational Facilities Manual released by the DepEd, the word "educational facilities" refers to all facilities that are located in the school grounds and inside

the school buildings. Also the terms educational school facilities, school plant, and physical facilities may be used interchangeably.

The physical facilities of the school are vital in the teaching and learning processes, as they do not only house the learners but also serve as catalyst of the enhancement and development of the learners' talents, skills and potentials. Thus, establishment of secured, adequate and satisfactory educational school facilities has to be of major concern, specifically in terms of their formation, procurement, development, improvement, maintenance, records keeping and accountabilities. Educational facilities have to be adaptable to the various teaching methods and strategies as educational processes are moving toward more active, interrelated and interactive environment (Deped, 2010).

According to Conley (1993) the classrooms have a significant role in the teaching and learning process because it is where students receive instruction and assistance that are necessary to attain the standards of the new curriculum. Additionally, Marzano (2000) analyzed the influences of school, teacher and student variables on variation in student achievement. His study showed that 13.3% of the variation is attributed to the teaching like instructional practices; 6.6% is attributed to school-related variables such as school climate; and 80% is accounted to the student variables such as socio-economic status. It can be deduced from the findings that variables closer to the classroom can influence the achievement of the students to a high degree, therefore it is important for teachers to have effective instructional materials and practices to help students maximize their potentials.

In terms of science teaching and learning, there should be adequate classrooms and laboratories with manageable class sizes; and sufficient and up-to-date educational resources

such as laboratory equipment, apparatus, tools and chemicals/ reagents (Ogunmande, 2015). Furthermore, Adal (2011) suggested in her study that it is necessary for schools that their general physical facilities should be improved and classroom population should be reduced.

Martin (2002) discussed that science laboratory is essential to facilitate students' construction of their knowledge based on science concepts and skills related to scientific processes (Mallari, 2016). This could be due to the fact that during laboratory experiments students are given the opportunity to manipulate materials and equipment in accordance to the principles and goals of the activity (Hofstein & Naaman, 2007 in Mallari, 2016).

McDermott, Shaffer and Constantinou (2000), as cited by Mallari (2016), identified three purposes of laboratory experiment: (1) to actively participate in acquisition and formation of scientific knowledge, (2) to see how scientific theories and principles were formed and justified; and (3) to understand how the implication and importance of scientific theories and principles were obtained.

However, the problem in inadequate school facilities in the country remains unresolved. In the article "*Science Education Realities*" by Jalmasco (2014), he emphasized that there is a shortage in the number of classrooms, but a more serious problem is the status of science laboratories in our schools. This is another challenge to Filipino teachers in performing hands-on science experiments as there as some experiments designed to be performed inside the laboratory.

Since physical facilities play a significant role in the teaching and learning process the school should make necessary improvement and upgrading to adhere with the requirements of the K to 12 Curriculum. The classroom should be at least a standard size;

the laboratories and equipment must be made available. Without these, objectives for the day will be difficult to achieve since a conducive classroom/ place has an immense contribution towards the learning of a child. Students will be able to understand one another and their teacher if they are in quiet, ideal, and well-ventilated rooms. Also, curriculum developers should much more take into consideration the insufficiencies that the teachers frequently mentioned regarding time and material and they should give more space in the curriculum to learning activities applicable to crowded classes. By this way, until physical facilities of all the schools have been improved, effectiveness of the curriculum will increase in a short period of time.

In addition to well-equipped and conducive school facilities, effective instruction needs well-designed instructional materials. Textbooks and other instructional materials should encourage the students to ask questions to elicit ideas, and should provide activities that connect students with the real life situations. In addition, student instructional materials can also be useful to teachers (Davis and Krajcik, 2005), since these provide overview of key concepts, describe how concepts are planned to be developed in a unit, and emphasize how each task in the unit is expected connect prior experiences of the students to help them identify key ideas.

Library and instructional materials are also important in the effective implementation of the new curriculum. Teachers cannot just give lecture every day without the use of effective teaching materials. Students should also be provided with reference materials that can help them in their research projects and lessons. The materials needed for different

subjects, equipment and other instructional devices must be made available for the students and teachers.

Snow et al. (1991) stressed that effective teachers use variety of materials, instructional methods, and classroom organizational plans such as open classrooms, three-group organizations). And since students today are faced with different technologies, the teachers have to keep abreast with the technological advancements to capture students attention during classroom instruction. Therefore, it is important for schools to have facilities that can provide the needs of the teachers and students for modern and technology oriented learning and teaching methods.

The School Administration

The school's working conditions as well as the implementation of any curriculum cannot be realized without the commitment of the administrators. According to Lindberg (2012), school leaders have crucial role in the success of the school. This could be due to the fact that school administrators influence the instructional and educational leadership impacting the students, teachers and staff development (Montgomery, in Ates & Artuner, 2013). Hence, school administrators must be familiar with available resources to support the diverse needs of students, parents and staff and must know how to access additional support in order to ensure appropriate education for all students and support for teachers (DiPaola & Walther-Thomas, 2003).

Since school administrators greatly affect the school operation and students and teachers performance, it is important for school administrators to be highly competent. Valentine and Prater (2011) found out that the school principal's effectiveness is affected by

its educational attainment. They also concluded that principals with more education are seen by their teachers as more effective leaders. It is important that the teachers have high perception of their principal's effectiveness because their confidence to the school administrators will reflect on their instruction and active participation to school activates, programs and services.

The school administrators' effectiveness can also be increased by "school management trainings" (Khan et. al, 2010). Khan et al (2010) also stressed that principals who attend trainings are more committed to motivating and satisfying their teachers and students by improving school environment through management of resources, providing opportunity for community involvement, and encouraging teachers development.

However, the study of Oluremi (2013) revealed that there are still many countries that do not put much importance on principals' training. Bush et al, as cited by Bouchmma (2014), discussed that specific trainings are not available to principals in some countries thus it is common that school principals start as teachers and later on promoted to administrative position due to experience.

"To actively change an organization, leaders must make decisions about the nature of the desired state" (Manasse, in Omalin, 2012). Thus, every school should have a mission statement and a vision based on shared values and beliefs. Administrators can engage all stakeholders in the process of developing the mission statement and vision for the school that provides focus and direction for all involved. (DiPaola & Walther-Thomas, 2003). Good leaders encourage others to be leaders and help bring out those qualities. Therefore, if teachers attend a conference or workshop, they can share their knowledge with the rest of

the staff when they return. Leaders can have experienced teachers work together to solve an instructional problem (Spitz, 2003). Also, the administrators should involve teachers in making decisions such as departmental scheduling, student scheduling and duty assignments (Price, 2003).

The administration is very much needed in the implementation of the new curriculum. Without their support, the students and teachers will not be able to meet the expected results of the new curriculum. Furthermore, the decisions that administrators make and how they make them have a direct impact on working conditions. It is always said, that the education of the child is a joint effort. It is necessary that the administration support the goals of the curriculum and teachers' plan that will make the learning process effective.

Synthesis

The aforementioned conceptual literature and studies would prove that researchers and experts in the field of education never ceased in attempting to identify variables that would lead to effective instruction and problems that hinder its success and come up with possible solutions to these constraints. However, there are still limited studies regarding the operation of Philippine schools overseas. There is a need to make more researches regarding the quality of education the Philippine schools overseas are offering to the Filipino youth because it would help in improving the administration and instruction of school administrators and teachers, respectively. Thus, this study concentrates on factors affecting the effective implementation of the new curriculum of Philippine schools in Qatar. The researcher believes in the merit of this study so that the school administrators, teachers and students are aware of the areas to be improved to enhance the quality of education.

The researcher was able to review the study of Sapungan (2013) where he assessed the performance of six Philippine schools in Jeddah, kingdom of Saudi Arabia through interviews and surveys of school administrators, faculty and staff. The major findings of the study include: the Philippine schools in Jeddah are hiring qualified teachers, the schools adapt competitive academic program, use suitable and conducive learning environment, and address academic problems intelligently. However, the respondents lowly assessed areas related to learning innovations, performance in school and outside school competitions, inspections of school facilities, science laboratory equipped with tools for experiments, and availability of internet connection. The study shows the strengths and weaknesses of the Philippine schools in Jeddah, kingdom of Saudi Arabia but fails to relate the findings to the school's effectiveness. Also, the research looks into the schools performance in general and not into the schools' implementation of the K to 12 Curriculum.

Based from the literature and researches discussed in this chapter, effective implementation of the curriculum is a complex task that there is no single factor to guarantee its success. Thus, it is important that the teachers and school administrators discuss and examine closely the curriculum to plan ways on how to effectively implement the new curriculum before adapting it. Because if there is no clear system and strategy on how to carry out the goals and standards of the K to 12 Science Curriculum, their efforts will be wasted. For instance, in the study of Adal (2011) she solicited the perceptions of the science teachers regarding the Elementary Science and Technology Curriculum and its implementation. She concluded that the science teachers made an effort to implement the curriculum but since they did not examine it closely, their "efforts go in vain". She also

added that the objective of the curriculum to make students scientifically and technologically literate persons was not the center of the learning activities in the classroom.

While the cited authors and researchers have different recommendations on how to overcome challenges in effective curriculum implementation, the researcher believes that the full commitment of the school administrators to lead strategic initiatives in improving the school facilities and resources; and student- and teacher-programs and services is essential. The teachers also have the responsibility to put into action the school plans and strategies; and effectively utilize the available facilities and resources to increase students' achievement.

CHAPTER 3

Research Methods

This chapter presents the research design, respondents of the study, research instrument, data gathering procedure, ethical considerations and validity of the research instruments, and statistical tools applied in the data collected.

Research Design

The study used the descriptive-survey research method. The descriptive-survey method was used because the aim of the study is to acquire clear picture or description of the present status of the implementation of K to 12 Science Curriculum of Philippines schools in Qatar through the use of survey questionnaire. Also, descriptive-survey is useful to (1) provide "value of facts" and (2) give focus on "most important things to be reported" (Paler-Calmorin & Calmorin, 2007). By using this research method, the researcher can obtain data that can be bases for implications that may help improve the teaching and learning of science in Philippine schools in Qatar. According to Johnson and Christensen (2012), descriptive research is sometimes used by educators to study the opinions, attitudes, behaviors, demographics, and beliefs of people.

Sampling and Participants

The respondents of the study were 277 high school students of Philippine International School Qatar (PISQ) out of a population of 896; and 281 high school students of Philippine School Doha (PSD) out of a population of 948 enrolled during the school year 2015-2016. All HS administrators and HS Science teachers of both schools served as

respondents. The number of participants is reflected in Table 2. The Slovin's formula using 5% error was used to get the number of student-respondents.

Table 1 shows the distribution of the respondents for the study.

Table 1

Distribution of the Respondents

	Administrators			Faculty			Students			Total	
School	N	n	%	N	n	%	N	n	%	N	n
PISQ	1	1	100	4	4	100	896	277	31	1797	559
PSD	1	1	100	4	4	100	948	281	30	1901	567
Total	**2**	**2**	**100**	**8**	**8**	**100**	**1844**	**558**	**30**	**3698**	**1126**

After identifying the sample size, proportionate allocation per section was performed. To determine the number and actual number per section, all the names of students in each section were placed in a box, and then the desired number per section was randomly selected. This process gave each student an equal opportunity to be chosen as participants of this study. The same procedure was used for all the other sections.

Research Locale

The study was conducted in Philippine Schools located at Doha, State of Qatar. Qatar is an Arab Emirates. Based on Islam, Qatar culture is almost the same as that of other countries of the Persian Gulf. Qatar offers many opportunities for expats in the Middle East and has been a host for many OFWs in the Middle East. At present there are two Philippine schools in Qatar: Philippine International School-Qatar (PISQ) and Philippine School Doha (PSD).

The Philippine International School-Qatar (PISQ) is a stock corporation established by Mr. Edgardo Basilio in March 2000. The PISQ operates in accordance with the Philippine curriculum for pre-school, elementary and secondary education for children of Philippine

expatriates. The PISQ exists as a private judicial entity under Philippine laws as it is registered with the Philippine Securities and Exchange Commission. The school's ultimate goal is to uphold the holistic growth of their students so that they come to be valuable and responsible citizens of the society.

On the other hand, the Philippine School Doha (PSD) was founded to attend the educational necessities of the Filipino children in the State of Qatar in October 1992. It was established out of the determination of pioneering members of the Philippine community in Doha under the support of the Philippine Embassy. The school has been categorized as a non-stock, non-profit educational corporation and is duly registered as the Philippine School in Doha, Inc. with the Securities and Exchange Commission, as mandated by the laws of the Philippines. As such, the school is ruled by the Corporation Code and special laws and regulations of the Philippines.

While other schools in Qatar operate every September to June of the year, PISQ and PSD start and end their school year, every June and March of the year. This is to accommodate students who are transferring either from Philippines to Qatar or vice versa.

Instrument

The researcher constructed a questionnaire geared on the intentions of the study. The researcher adapted the AACCUP Survey Instrument which has ten (10) components: (1) vision, mission goals and objectives, (2) faculty, (3) curriculum and instruction, (4) students, (5) research, (6) extension and community development, (7) library, (8) physical facilities, (9) laboratories and (10) administration. However, modifications were made, like some components were excluded or combined, to suit the purpose of the current study.

The Student Survey Form (see Appendix H) is a questionnaire that assesses students' perceptions of their schools' readiness to effectively implement the new curriculum in terms of the 4 given domains. The Student Survey Form is divided into 4 domains: physical facilities (17 items), instruction (30 items), support to students (13 items) and library and instructional materials (15 items).

Similarly, the Administrator/ Faculty Survey Form (see Appendix I) was used to measure the degree of readiness of Philippine Schools in Qatar to effectively implement the K to 12 Science Curriculum as perceived by the administrators and faculty-respondents. The Administrator/ Faculty Survey Form is consists of 6 domains: physical facilities (22 items), instruction (35 items), content (6 items), support to students (13 items), library and instructional materials (15 items) and administration (20 items). Two domains, content and administration, are not included in the Student Survey Form since students cannot appropriately evaluate these two areas for they lack the level of maturity and understanding necessary to appraise the mentioned components.

In the study, the schools' readiness is dependent on the condition of the 6 domains as assessed by the students, faculty and administrators. The respondents were asked to respond to the different attributes related to each domain on a 5-point Likert Scale where 4=excellently attained, 3=highly attained, 2=attained, 1=slightly attained, 0=not attained and NA=not applicable.

The instrument also consists of an open-ended question where the respondents identified the challenges being encountered by Philippine schools in Qatar to effectively implement the K to 12 Science Curriculum in terms of the given domains.

For validation purposes, content validity was used. This was used to identify whether the items were relevant and appropriate to the study. The instrument was evaluated by three experts from the Philippine Normal University. The researcher also utilized the evaluator's checklist made by Duad (2010).

Data Gathering Procedure

In conducting the study, the researcher sought permission from the Philippine Consulate General in Doha. Afterwards, the researcher wrote a formal letter addressed to the HS Principal and HS Coordinator asking for permission to conduct the study.

Following the ethical procedure in conducting a research study, the researcher sent a letter of consent to the parents of the students explaining the purpose of the study prior to administering the questionnaire. After the student-participants were identified, the researcher asked the school administrators for the permission to use the library as venue for data gathering procedure. The student-respondents were then gathered in the library, 2 sections at a time, and the researcher explained the study and its processes. The researcher personally administered the questionnaire to the students to ensure proper explanation regarding the purpose and nature of the study were given and the questionnaires were answered in the correct manner by which it should be accomplished. The questionnaires were retrieved after they were duly accomplished and the papers were grouped according to their year level.

In the case of the faculty-respondents, the researcher distributed the questionnaires, through the HS department head together with the administrator-survey form. The questionnaire was enclosed in an envelope with the letter explaining the purpose of the study

and instructions to make sure the respondents completed them properly. The questionnaires were then collected after a week through HS administrators. To ensure the confidentiality of the responses, the participants were instructed to seal the envelope before returning the accomplished questionnaire.

The responses were then tallied and collated in tables for purposes of analysis and interpretation.

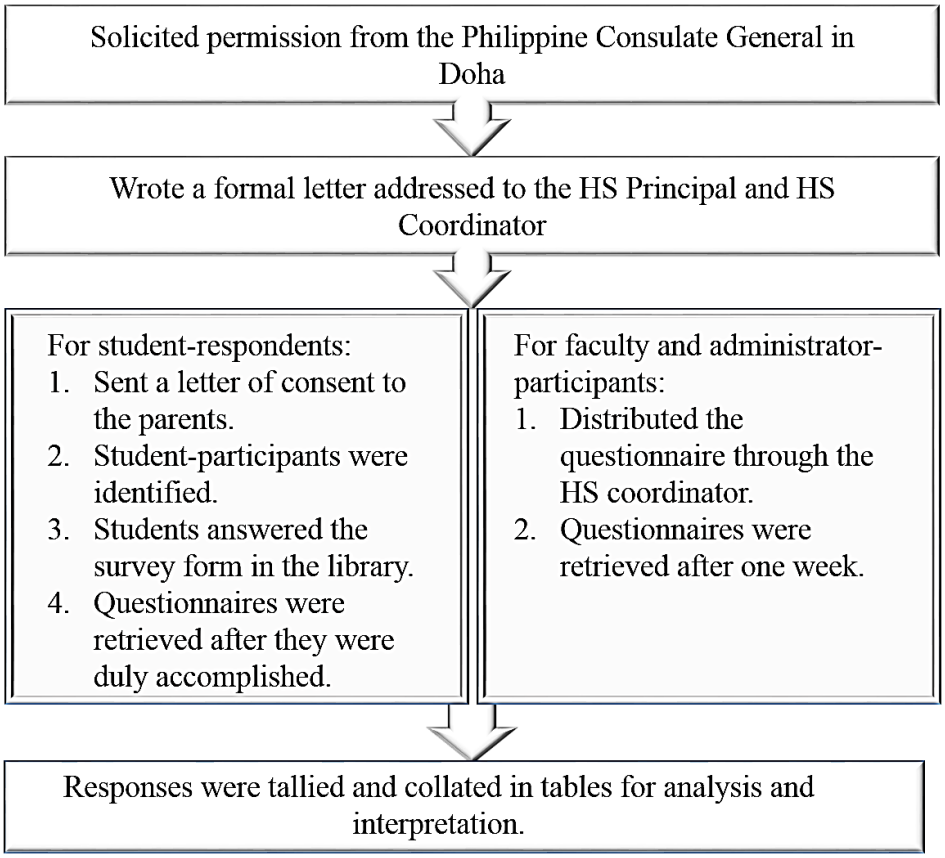

Figure 2. Flowchart of the data collection process.

Data Analysis

The level of schools readiness to effectively implement the K to 12 Science Curriculum was established based on the schools' existing physical facilities, instruction,

content, support to students, library and instructional materials and administration. The aspects of schools' readiness were measured on a scale of 0 to 4 and each component level of readiness was assessed on a five-point Likert type scale (Watkins, Leigh & Triner, 2004). On the Likert-type scale, the readiness level was bench marked as: "not ready lot of work to be done" for means 0.00-0.49, "not ready some work to be done" for means between 0.50-1.49, "expected level of readiness" for means between 1.50-2.49, "ready but need some improvements" for means between 2.50-3.49, and "ready to go" for means between 3.50-4.00

After gathering the data, analysis was made. The problem statements indicated in the first chapter were interpreted using percentage, frequency distribution and descriptive statistics such as mean and standard deviation. The computed means were interpreted using the scale below:

Table 2

Mean Score Range Interpretation

Mean Score Range	Interpretation	Readiness
3.50- 4.00	Excellently Attained (EA)	Ready to go ahead
2.50- 3.49	Highly Attained (HA)	Ready but needs a few improvements
1.50- 2.49	Attained (A)	Expected level of readiness
0.50- 1.49	Slightly Attained (SA)	Not ready, needs some work
0.00- 0.49	Not Attained (NA)	Not ready, needs a lot of work

All statistical hypotheses were tested using the .05 level of confidence.

Ethical Considerations

Since the study involved human participants, the researcher performed specific steps to address the ethical considerations with emphasis to the student-respondents, ages 10-16. To establish trust to the participants, the researcher obtained first the permission of the Philippine Consulate General in Doha. After the endorsement of the Philippine Embassy in Doha, the researcher wrote a formal letter addressed to the School Head and HS Principal for permission to conduct the study and to adhere with the rules and regulations provided by both schools. After securing permission, the researcher distributed the "Informed Consent Form" (see Appendix G) to the students to be signed by their parents/ guardians. The consent forms were then collected and those who were not permitted by their parents/ guardians to participate were excluded in the study.

To ensure the privacy, security and protection of the student-respondents, the data gathering procedure was performed inside the library of their respective schools with the close supervision of the researcher. In addition to the support of the teachers and library staffs, there were also available security personnel to maintain the safety of the participants. The assent of the student-participants was obtained orally. The informed consent form that was signed by their parent/ guardian was explained to the students in a language appropriate to their age and maturity. It was also made clear to them that should they decide to object or terminate their participation to the study they will not be punished or scolded. The researcher then administered the questionnaire and explained to them the proper ways the questionnaires have to be accomplished. The participants were also ensured that their responses will be kept confidential to encourage them to be truthful to their responses to the

items in the questionnaire. It took approximately 20 minutes for the students to answer the questionnaires.

Prior to their participation, the respondents indicated that they have read and understood the nature of the study, and had the opportunity to contact the researcher for any concern regarding the research procedure.

In order to protect the privacy of the participants during the course of the study, no one other than the researcher had accessed to the raw data. Paper records were kept in a locked file cabinet. Electronic records were stored on the hard drive of a password protected personal computer and in a web based "cloud" system such as Google drive with restricted access. All the raw data will also be shredded and deleted as soon as the completion of the study.

The result of the study will be made available to the participants through the school administrators of their respective schools. A contact number was also indicated in the letter of invitation given to them so they can speak to the researcher if they are interested regarding the result of the investigation.

Although the researcher was connected to one of the Philippine schools in this study, there was no conflict of interest present since no any financial and personal relationship to third parties involved whose interests could possibly influence the result of the study. In addition, the researcher was not granted, did not seek, attempted to obtain or accepted and will not grant, seek and obtain or accept any advantage, financial or in kind, to or from any third party as an incentive or reward relating to the outcome of this investigation.

The findings of the study may be shared to the different stakeholders of Philippines schools in Qatar so people in authority can reflect or discuss significant issues presented in this study to enhance the implementation of K to 12 Science Curriculum. It was also explained to the respondents that the result of this research may be disseminated to other individuals or groups other than the participants to contribute to similar undertakings. The participants were assured that the data gathered in this study are anonymous so the researcher will be unable to tell whose information is whose when the findings were analyzed and reported and will be unable to provide identifiable information in any reports that will be disseminated.

CHAPTER 4

Presentation, Analysis and Interpretation of Data

This chapter presents the analysis and interpretation of the statistical findings of the study. The findings are presented according to the sequence of the problems as stated in the initial chapter.

Evaluation of Students

The readiness of Philippine schools in Qatar to effectively implement the K to 12 Science Curriculum was assessed by the students based on physical facilities, instruction, support to students and library and instructional materials. The data were summarized on the following tables. Descriptive statistics such as percentage, mean and standard deviation were used to provide more meaning to the assessment.

Domain A: Physical Facilities

Educational facilities provide a major support system to the effective implementation of the Science curriculum, for they do not only shelter the learners but they also serve as channels for the enhancement of the knowledge and skills of the students for the maximum development of their skills, talents and potentials. Due to the current change in the curriculum, the school's physical facilities must be adaptable and responsive to the changes in the teaching methods and educational processes to ensure the effective implementation of the new curriculum. Like for example, the K to 12 Science Curriculum is basically learner-centered and inquiry-based, such learning environment can only be achieved if students are exposed to varied hands-on, minds-on and hearts-on activities. Therefore, the classrooms and science laboratories must have adequate space, materials and equipment to support the

learning activities designed by the teacher and to encourage the active participation of the learners. Based on the 2010 Educational Facilities Manual of the DepEd, the classroom must be 1.40 sq. m. per place, while the science laboratories must be 2.10 sq. m. per place and should have at least two entry/exit doors that swing outward so the students can freely move and the teacher can easily manage the class during classroom activities or science experiments. Additionally, sufficient and modern equipment, materials and supplies must be present as they assist the learning performance, thereby facilitating the successful implementation of the curriculum.

Table 3 shows the statistical summary for Domain A: Physical Facilities.

Table 3

Statistical Summary on Physical Facilities According to Students

	PISQ			PSD			Overall		
Physical Facilities	***M***	***RANK***	***VI***	***M***	***RANK***	***VI***	***M***	***RANK***	***VI***
A. Classrooms	2.20	3	A	2.40	3	A	2.30	3	SA
B. Science Laboratories	2.25	2	A	3.02	2	HA	2.64	2	HA
C. Equipment, Materials and Supplies	2.35	1	A	3.04	1	HA	2.70	1	HA
AVERAGE	**2.27**	**-**	**A**	**2.88**	**-**	**HA**	**2.58**	**-**	**HA**

Based on the overall rating of highly attained, 2.58, the physical facilities of Philippine schools in Qatar are ready but require few improvements to effectively implement the new curriculum. Table L1 (see Appendix L) displays a more detailed data about the perception of the students towards physical facilities, which shows that the science laboratories of PISQ and PSD are clean, neat and orderly having obtained the highest mean out of 17 statements in domain A, 2.70 (1.10) and 3.42 (0.79), respectively. Also, the findings revealed that PISQ's laboratory is properly lighted and well ventilated, 2.65 (1.02) and has equipment/ instruments that are in good condition and are periodically calibrated,

2.54 (1.11). PSD, on the other hand, has a laboratory with usable fire extinguishers, first aid kit with other emergency materials that are accessible to teachers and students, 3.22 (0.88) and has at least two exit doors that open outward, 3.16 (1.22). The results imply that the Philippine schools in Qatar have provisions for classrooms, science laboratories and equipment, materials and supplies.

But, further examination of the data reveals that the standard deviations of the items are high (0.79-1.82), which implies that the responses were highly dispersed around the mean. This suggests that although the students are satisfied with their schools' physical facilities, there is still a need to improve this area, specifically the classrooms since it obtained the lowest mean, 2.30, out of the three subdomains. The results indicate that the classroom size is inadequate, has insufficient furniture (tables and chairs) and equipment (TV, projector, speaker, etc.), and lacks maintenance of cleanliness and orderliness. Additionally, the science laboratories although assessed as highly attained, present various issues such as poor furniture/ equipment arrangement that allows free flow of movement and enables students to work comfortably without interference; absence of gas, water and electricity during science experiments and activities; unavailability of demonstration table equipped with sink, water, electrical and gas outlets; and insufficient equipment, instruments, and materials needed in the laboratory. These issues can hinder the effective implementation of K to 12 Science Curriculum for it will be difficult to establish an inquiry-oriented and learner-centered learning environment; and engage the students to varied hands-on activities if there are poor physical facilities. Moreover, scientific investigation is a central feature of the new science curriculum, but the difficulty in performing scientific

experiment and scientific inquiry does not only root from the demonstration experiment presented in textbooks, but also due to problem in laboratory equipment (Law & Li, 2013). Therefore, both schools should invest on improving and upgrading their physical facilities, especially PISQ since all sub-domains was only rated as attained by their students.

Domain B: Instruction

Instruction is a crucial factor in the effective implementation of the new curriculum, for it is in this stage where the planned topics and activities in the curriculum are translated by the teachers into meaningful learning experiences to suit the individual characteristics of the learners. It is specified in the 2013 K to 12 Science Curriculum Guide that the following approaches: inquiry-based approach, science-technology-society approach, problem/issue-based learning, contextual learning, and multi/ interdisciplinary approach, facilitate the acquisition of scientific knowledge, process and skills, and values and attitudes in the new curriculum. Thus, the teacher's teaching methods and techniques must reflect those approaches.

Table 4 shows the statistical summary for Domain B: Instruction.

Table 4

Statistical Summary on Instruction According to Students

	PISQ			PSD			Overall		
Instruction	***M***	***RANK***	***VI***	***M***	***RANK***	***VI***	***M***	***RANK***	***VI***
A. Teaching Method and Techniques	2.85	2	HA	2.82	2	HA	2.84	2	HA
B. Assessment of Academic Performance	2.92	1	HA	2.96	1	HA	2.94	1	HA
AVERAGE	**2.87**	**-**	**HA**	**2.86**	**-**	**HA**	**2.87**	**-**	**HA**

It is clearly shown on the table that the instruction of both schools is highly appraised by the students as reflected on its mean, 2.87, with a verbal interpretation of highly attained.

Table L2 (see Appendix L) reveals that the teachers from PISQ allow students to ask questions, discuss possible answers to the questions and make decisions; and have extensive knowledge of basic science concepts and their applications to daily life and with other disciplines, since these statements obtained the first two highest means out of 30 items in domain B, 3.27 (0.95) and 3.25 (0.91), respectively. On the other hand, the teachers from PSD know laboratory equipment, tools, and other instructional materials to be able to work with students with varying learning needs, 3.32 (0.90), and practices safe and proper laboratory techniques for the preparation, storage, dispensing, supervision, and disposal of all science materials used in teaching and learning, 3.27 (0.90), as assessed by the student-participants. However, it is noteworthy that the students lowly appraised the tools/ strategies being used by their science teachers during classroom instruction such as model/ dummy, experiments, problem-solving, interactive learning, film-showing/ video, and reporting (see Table L2, Appendix L). This implies that the science teachers of both schools have science knowledge and skills needed to realize the content of the curriculum, but their teaching tools/ strategies do not arouse the interest of the learners and do not develop critical thinking. This could be attributed to the problems on physical facilities as discussed in domain A. Yet, students from both schools show satisfaction towards instruction as most of the ratings are "highly attained", which is indicative of the science competency of the teachers of both schools. This suggests that the teachers are doing their best to effectively implement the new curriculum and are not compromising the quality of instruction despite of the issues in physical facilities.

In terms of assessment, the new curriculum is standards/ competence-based and outcome-based. The data suggests that aside from the traditional forms of assessment like quizzes, unit tests, projects, and reflection/ reaction papers, the teachers from both schools are giving performance/ practical tests. This is an indication that in terms of assessment, both schools are complying with the requirement of the new curriculum.

It can be deduced that in terms of instruction, the Philippine schools in Qatar as assessed by the students are ready to effectively implement the new curriculum but need some improvement as reflected on the high standard deviations (0.90-1.67) indicating that the responses are heterogeneous with each other. Greater attention must be given to the teachers' teaching tools and strategies which must be responsive to the current requirements of the new curriculum. The teachers must be creative and resourceful in planning learning activities given the current condition of their school's physical facilities.

Domain C: Support to Students

Various science activities and programs provided by the school for students' development are also important in the effective implementation of the new curriculum. Exposing the students to science activities (quiz bee, research, exhibit, etc.), science trainings, science organizations, educational tours/ learning visits and seminars/ symposia/ workshops extend the classroom instruction by deepening and enhancing the students' science skills.

Table 5 shows the statistical summary for Domain C: Support to Students.

Table 5

Statistical Summary on Support to Students According to Students

Support to Students	PISQ			PSD			Overall		
	M	***RANK***	***VI***	***M***	***RANK***	***VI***	***M***	***RANK***	***VI***
A. Student Programs and Services	2.20	2	A	2.36	2	A	2.28	2	A
B. Student Development	2.41	1	A	2.69	1	HA	2.55	1	HA
AVERAGE	**2.26**	**-**	**A**	**2.47**	**-**	**A**	**2.37**	**-**	**A**

As seen on table 5, the overall assessment by the students of the support given to them by the school is attained, 2.37, which indicates that the Philippines schools in Qatar are within the expected level of readiness to effectively implement the new curriculum. It can be deduced that both schools are providing science activities (quiz bee, research, exhibit, etc.), adequate staff, physical facilities, equipment and materials for various student science activities; and have clear policies and procedures of student recruitment, selection, and admission in various science activities/ program/ organization/ competition (see Table L3, Appendix L). This indicates that the schools regularly conduct science quiz bee, research, exhibit, etc. because they have provision for staff, facilities and recruitment process. However, the findings reveal that both schools rarely conduct science trainings, educational tours/ learning visits and symposia, seminars, workshops, professional lectures, as these three activities obtained the lowest means out of 13 items in domain C. This shortcoming can be attributed to the setting of the host country which resulted to limited exposure of the students to field trips, seminars, and the like.

The limited science programs and services provided by both schools can hold back the effective implementation of the K to 12 Science Curriculum. Highlighted in the new curriculum are the 21st century skills expected to be acquired by the students as they

graduate, which include information, media and technology skills, learning and innovation skills, effective communication skills, and life and career skills. But, acquisition of these skills cannot be solely accomplished by classroom activities provided by the teacher. Furthermore, the K to 12 Science Curriculum puts emphasis on activities that will motivate the students see science as useful and relevant and apply science concepts in real life context. Hence, it is the school's responsibility to provide students with science related programs and services that will link science and technology in the personal, ethical, social and economic aspects of the society.

Domain D: Library and Instructional Materials

A salient feature of the K to 12 Science Curriculum is its spiral progression, where earth science, biology, chemistry and physics are all linked and incorporated within and across grade levels. Furthermore, the new curriculum puts emphasis on the use of evidence during class discussion or argument. Hence, the library with varied instructional materials plays a significant role in the effective implementation of the new curriculum.

Table 6 shows the statistical summary for Domain D: Library and Instructional Materials.

Table 6

Statistical Summary on Library and Instructional Materials According to Students

Library and Instructional Materials	**PISQ**			**PSD**			**Overall**		
	M	***RANK***	***VI***	***M***	***RANK***	***VI***	***M***	***RANK***	***VI***
A. Collection Development, Organization and Preservation	2.61	1	HA	2.89	1.5	HA	2.75	1	HA
B. Services and Utilization	2.14	3	A	2.88	3	HA	2.51	3	HA
C. Physical Set- Up and Facilities	2.59	2	HA	2.89	1.5	HA	2.74	2	HA
AVERAGE	**2.44**	**-**	**A**	**2.88**	**-**	**HA**	**2.66**	**-**	**HA**

The table shows that the overall evaluation of library and instructional materials is highly attained, 2.66. Thus, in terms of this domain the Philippine Schools in Qatar are ready for the effective implementation of the curriculum, yet some improvements are required which is also indicated by the high standard deviations of all the items (0.88-1.51), indicating that the responses are loosely clustered around the mean.

Table L4 (see Appendix L) shows that the library of both schools has organized collection and well ventilation. But, upgrading is needed specifically in terms of the availability of non-print, digital and electronic science resources, on-line public access (OPAC), inventory reporting, internet searching, and reading room that can accommodate at least 10% of the school enrollment at any given time, as these attributes were lowly appraised by the students out of 15 statements under this domain. This implies that the library of both schools has complied with the basic needs of the students, yet it lacks provision for modern services such as access to internet, non-print, digital and electronic science resources. Also, the results suggest that there is a need to expand the library to accommodate more clientele.

As mentioned the new curriculum uses spiral progression approach, therefore the use of a single textbook will not suffice since all sciences are already integrated in all grade levels. Furthermore, the K to 12 Science Curriculum requires the promotion of strong link between science and technology; and encourage investigations of problems at the local or national level that will require the use of appropriate technology so learners can communicate with students in other parts of the Philippines or even from other countries. Thus, the issues on the library and instructional materials must be addressed because having

limited resources and the lack of technology can delay the effective implementation of the new curriculum.

The Overall Readiness According to Students

Table 7 shows the mean summary of the readiness of Philippine schools in Qatar to effectively implement the K to 12 Science Curriculum in terms of the four domains as perceived by the students.

Table 7

Overall Readiness According to Students

Domain	PISQ			PSD			Overall		
	M	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A: Physical Facilities	2.27	3	A	2.88	2	HA	2.58	3	HA
B: Instruction	2.87	1	HA	2.86	3	HA	2.87	1	HA
C: Support to Students	2.26	4	A	2.47	4	A	2.37	4	A
D: Library and Instructional Materials	2.44	2	A	2.88	2	HA	2.66	2	HA
Average	**2.46**	**-**	**A**	**2.77**	**-**	**HA**	**2.62**	**-**	**HA**

It is reflected on the findings that the Philippine schools in Qatar according to the students are ready to effectively implement the K to 12 Science Curriculum, based on the overall rating of highly attained, 2.62, with some improvements to be done.

The results imply that among the four given domains, the students have the highest regards on instruction, 2.87. Having strong instruction can lessen the negative impacts of the other domains to the effective implementation of the new curriculum. As stressed by Law & Li (2013), “the professional background of science teachers is the main factor for effective science curriculum implementation”.

However, the data reveal that support to students requires greater attention since this domain was only assessed by the students as attained. The school's science programs and services must be improved as they serve as channels to deepen the students' understanding of the usefulness and relevance of science in real life scenarios; and enhance the students' science skills. Moreover, the lack of school's science programs and services can limit the venue for students' acquisition of the 21st century skills they will need for future employment.

Physical facilities must also be improved since it received the second lowest mean, 2.58. The issues concerning the physical facilities must be addressed for they greatly influence the teaching and learning process. The available space, materials and equipment dictate the kind of learning experiences the teacher will provide to the learners. If there are limited space, materials and equipment, the teacher may be discouraged to engage the students to hands-on experiments and collaborative/ cooperative group work which can cause dullness of science instruction and lead the students to dislike science.

Faculty's Evaluation of the Schools' Readiness

The following tables displayed and summarized the readiness of Philippine schools in Qatar to effectively implement the K to 12 Science Curriculum as assessed by the teacher-participants based on physical facilities, instruction, content, support to students, library and instructional materials and administration. Frequency and percentage distribution, mean and standard deviation were employed to reveal the schools' readiness.

Domain A: Physical Facilities

The K to 12 Science Curriculum aimed to promote the scientific processes and skills of the students by working on problems and situations that encourage them to arrive with answers supported by evidences. The realization of this goal can be facilitated by the school's physical facilities; with emphasis on science laboratories with satisfactory materials and equipment. Moreover, physical facilities have direct impact on the behavior and attitude of the teachers and students towards science. Any science teacher recognized the value of hands-on experiments in Science teaching, however if there are limited space and insufficient materials, the teacher's desire to deviate from textbook and memorization of facts is prevented. As a result the teacher will just resort to lecture, demonstration, or use of video even if the intention is to develop science processes and skills among the students since it is easier than managing the space and resources during an experiment. Consequently, the lack of opportunities for the students to explore and investigate through hands-on experiments produce dullness of Science teaching and lead them to dislike learning of science.

Table 8 shows the statistical summary for Domain A: Physical Facilities.

Table 8

Statistical Summary on Physical Facilities According to Faculty

	PISQ			PSD			Overall		
Physical Facilities	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Classrooms	2.25	1	A	2.38	2	A	2.32	1	A
B. Science Laboratories	1.48	2	SA	2.28	3	A	1.88	2	A
C. Equipment, Materials and Supplies	0.84	3	SA	2.50	1	HA	1.67	3	A
Average	**1.39**	**-**	**SA**	**2.38**	**-**	**A**	**1.89**	**-**	**A**

From table 8 above, it can be inferred that for the teacher-respondents the Philippine schools in Qatar in terms of physical facilities are within the expected level of readiness to effectively implement the K to 12 Science Curriculum, as reflected on its overall mean, 1.89 interpreted as attained. Compared to the ratings given by the students and administrators, it can be observed that the faculty members feel the necessity for more improvement in their schools' physical facilities. This could be due to the fact that they are aware of the ideal physical facilities required for an effective science instruction therefore, they can clearly identify which areas require upgrading to advance the quality of teaching and learning of science.

Table M1 (see Appendix M) shows that for the teacher-participants, the classrooms of PISQ are well lighted, ventilated, acoustically conditioned, clean and orderly, for having obtained the highest mean 2.75 (0.50). On the other hand, the classrooms of PSD are provided with enough furniture (tables and chairs) and equipment (TV, projector, speaker, etc.); and the science laboratories implement safety and precautionary measures; and provide usable fire extinguishers, first aid kit, and other emergency materials accessible to teachers and students, as these attributes received the highest mean, 3.00 (0.82). These imply that both schools have provision for classrooms, science laboratories, equipment, materials and supplies, but table 5 suggests that PISQ has to give greater attention on science laboratories and equipment, materials and supplies as these two sub-domains were rated as slightly attained by their students.

It is also reflected on the findings that the classroom size of both schools has to be increased to allow mobility during classroom activities. Conversely, the science laboratories

have to be expanded and be provided with furniture/ equipment, materials/ supplies, gas, water, and electricity for science experiments and activities. Therefore, the Philippine Schools in Qatar have to improve and upgrade their physical facilities for students' talents and skills are not being properly channeled if schools have poor basic infrastructural facilities necessary for effective implementation of the curriculum (Soneye & Agbonluare, 2013). Moreover, both schools must acquire apparatuses, tools and materials that promote scientific investigations and explorations as these are means for the students to understand science concepts and apply these concepts into concrete situations.

Domain B: Instruction

The K to 12 Science Curriculum is learner-centered, inquiry-based and globalized, therefore the teachers must shift from the traditional way of teaching where the students just sit silently on their chairs and the teachers do most of the talking, to a classroom where the teachers serve as facilitators of learning by engaging students to investigative activities, collaborative group work, and technology-oriented practices. Even though the educational system shifts to giving the students freedom to learn at their own pace, much of the responsibilities in the teaching and learning process still fall on the teachers. Learning only takes place in a student-centered and inquiry-based instruction, if the teachers engaged the students to meaningful activities, asked questions that will arouse the students' curiosity, and provided real-life situations/ problems that will motivate the students to appreciate science.

Table 9 shows the statistical summary for Domain B: Instruction.

Table 9

Statistical Summary on Instruction According to Faculty

Instruction	PISQ			PSD			Overall		
	M	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Teaching Method and Techniques	2.89	1.5	HA	3.11	2	HA	3.00	2	HA
B. Assessment of Academic Performance	2.89	1.5	HA	3.47	1	HA	3.18	1	HA
Average	**2.89**	**-**	**HA**	**3.20**	**-**	**HA**	**3.05**	**-**	**HA**

Table 9 shows that the instruction of Philippine schools in Qatar is ready for the effective implementation of the K to 12 Science Curriculum with few improvements to be done, as reflected on its overall mean, 3.05 corresponding to highly attained. This implies that despite of the issues on their school's physical facilities, the teachers are confident that they can impart the content of the curriculum to the learners successfully.

Table M2 (see Appendix M) shows that the teachers of PISQ are utilizing varied teaching tools and strategies; textbook, calculator, model/ dummy, experiments, problem-solving, interactive learning, film-showing/ video and reporting all having the same means and standard deviations, 3.25 (0.50), as they highly appraised attributes under this category except for group work/ pair work, 3.00 (0.82). This implies that the PISQ teachers rarely conduct group work/ pair work which could be due to the limited classroom space, yet this does not limit their willingness to provide varied learning experiences to the students. On the contrary, the teacher-participants from PSD lowly rated the following tools/ strategies ; calculator, model/ dummy, problem-solving, interactive learning, film-showing/ video and reporting, all with the same means, 3.00. Yet, it is noteworthy that textbook, experiments and group work/ pair work were highly rated by the PSD teachers, this indicates that they are still providing varied learning experiences to the students but could be restricted by the

availability of the required equipment and materials to make their teaching more dynamic. The low standard deviations indicate that the responses are tightly clustered around the mean.

However, the results indicate that the science teachers from both schools need constant updating of their content-knowledge and pedagogical-knowledge as they lowly rated attributes related to the characteristics of an effective science teacher. Among the lowly appraised qualities are: the teacher has an extensive knowledge of basic science concepts and their applications to daily life and with other discipline; understands the unique characteristics of learners, their strengths and potential, talents, abilities and perspectives; knows a wide range of ways in which learners are likely to learn science best; clarifies and develops students' understanding of scientific concepts under investigation; provides learners with opportunities to identify relevant science topics and issues (including personal and social issues); and assists students with academic deficiencies and other problems which may affect their grades. "The professional background of science teachers is the main factor for effective science curriculum implementation" (Law & Li, 2013), thus the teachers with the support of the administration must engage in trainings/ workshops/ seminars and post-graduate studies to strengthen their science knowledge and student management skills which will translate to their teaching inside the classroom.

Domain C: Content

The content should promote the acquisition of the 21st century skills and should encourage the application of science to local and global settings. Based on the assessment of the faculty, in terms of content the Philippine schools in Qatar are prepared to effectively

implement the K to 12 Science Curriculum but some improvement must be done, as reflected on the overall mean of 3.06, interpreted as highly attained. It is shown in Table M3 (see Appendix M) that the content encourages students to develop their innate talents and skills to become productive citizens, develops or enhances self-confidence through group dynamics in science learning, and provides opportunity to be globally aware and competitive. These are all attuned with the objective of the new curriculum which is to develop scientific literacy to the Filipino youth so they can become active citizens who are able to make relevant and appropriate decisions that can have impact on the health, environmental and social aspects of the society, both locally and globally.

Domain D: Support to Students

The school's support to students can contribute to the achievement of the goal of the curriculum, therefore promoting its effective implementation. The learning experiences provided by their teachers inside the classrooms are not enough to learn science holistically, thus the school should regularly conduct science activities, educational tours/ learning visits/ other co-curricular activities, symposia, seminars, workshops, professional lectures and provide science trainings and organizations so the students will experience science in real-life context and inspire them to pursue science related-professions in the future.

Table 10 shows the statistical summary for Domain D: Support to Students.

Table 10

Statistical Summary on Support to Students According to Faculty

Support to Students	PISQ			PSD			Overall		
	M	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Student Programs and Services	2.61	1	HA	3.39	1	HA	3.00	1	HA
B. Student Development	2.40	2	A	3.25	2	HA	2.83	2	HA
OVERALL	**2.56**	**-**	**HA**	**3.35**	**-**	**HA**	**2.96**	**-**	**HA**

The school's support to students was considered by the faculty as highly attained, 2.96, which indicates that the Philippine schools in Qatar are ready for the effective implementation of the K to 12 Science Curriculum in terms of this domain with the requirement of few improvements.

As reflected on Table M4 (see Appendix M), both schools are providing science activities (quiz bee, research, exhibit, etc.) and encouraging the participation of the students in regional/ district/ international science competitions and science organizations/ campaigns. This is an indication that the schools are providing channels for the enhancement and deepening of science concepts and skills learned by the students inside the classroom.

Yet, improvement must be made on the science programs and services offered to the students, specifically in terms of provision for educational tours/ learning visits/ other co-curricular activities, adequate funding for the conduct of science activities and programs, adequate staff, physical facilities, equipment and materials for various student science activities; and clear policies and procedures of student recruitment, selection, and admission in various science activities/ program/ organization/ competition. This suggests that although the schools are providing science activities and opportunity for regional/ district/ international science competitions/ organizations/ campaigns, there are still shortcomings related to educational tours/learning visits, funding, staffing and selection process which can

negatively impact the effective implementation of the new curriculum since science is learned best when the concepts discussed inside the classrooms are used in context. Yet, this limitation could be attributed to the guidelines and characteristics of the host country.

Domain E: Library and Instructional Materials

The library collection must be updated and organized because the library plays a vital role in the effective implementation of the K to 12 Science Curriculum. The new curriculum puts emphasis on developing students who are effective communicators and critical problem solvers, thus a library with updated and modern resources will help in the effective implementation of the new curriculum. Moreover, the new curriculum required the students to support their explanations with evidences and link other science topics and disciplines; therefore the use of their science textbook will not suffice. In the 2010 Educational Facilities Manual released by the DepEd, the library should be 2.40 sq. m. per place in size, can accommodate at least 10% of the enrolment, have minimum of 5 books per student, and have reading area that can accommodate 40 students at a time with minimum size of 1.20 square meters per place.

Table 11 shows the statistical summary for Domain E: Library and Instructional Materials.

As seen on Table 11, in terms of library and instructional materials the Philippine schools in Qatar are within the expected level of readiness to effectively implement the K to 12 Science curriculum as reflected on its overall mean, 2.17 interpreted as attained.

Table 11

Statistical Summary on Library and Instructional Materials According to Faculty

Library and Instructional Materials	PISQ			PSD			Overall		
	M	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Collection Development, Organization and Preservation	2.06	1	A	2.44	2	A	2.25	1	A
B. Services and Utilization	1.80	3	A	2.55	1	HA	2.18	2	A
C. Physical Set- Up and Facilities	1.88	2	A	2.33	3	A	2.11	3	A
OVERALL	**1.90**	**-**	**A**	**2.43**	**-**	**A**	**2.17**	**-**	**A**

Based on Table M5 (see Appendix M), the library of Philippine schools in Qatar has quality and quantity of science books and materials that conform with the needs of the students and teachers, 2.50; and has librarians and staff that are available during library hours to assist and provide library services, 2.50. This implies that the faculty-respondents are satisfied with the quantity and quality of library collection and with the service of the librarians and staff. The results also show that in terms of collection development, organization and preservation, the library needs to organize, 2.13, and maintain a relevant and updated collection, 2.00. As regards to services and utilization, the library needs to provide on-line public access (OPAC), 2.13, inventory reporting, 1.75, and internet searching, 2.13. In terms of physical set-up and facilities, the library has to expand to meet the requirements of the present enrollment, 1.88, and to accommodate at least 10% of the school enrollment at any given time, 2.00. This is an indication that there is a great need to improve the library and instructional materials of both schools.

The findings that the library and instructional materials of Philippine schools in Qatar require major improvement can negatively affect the effective implementation of the new curriculum. Unlike the old curriculum that there is a specific branch of science per year level like biology in 2nd year, chemistry in 3rd year and physics in 4th year, the new curriculum

uses spiral progression approach which means different branches of science are integrated within and across each grade level. Additionally, the new curriculum emphasized the integration of science to other topics and disciplines; therefore the availability of varied and modern instructional materials is important in realizing the goals of the new curriculum.

Domain F: Administration

Since the new curriculum was just implemented six years ago, the school administrators have the responsibilities to provide trainings for the teachers regarding the new curriculum and modern approaches in science teaching; construct appropriate physical facilities to establish a learner-centered and inquiry-based learning environment; acquire sufficient and modern instructional materials and science apparatuses/ equipment/ supplies to support the varied science activities and strategies required to develop the scientific literacy among the students; and supervise teachers' practices to ensure that the school is effectively implementing the K to 12 Science Curriculum through the efforts of the teachers. Furthermore, the administration's commitment for the development of science learning translates on the materials, activities and services they provide to the students.

Table 12 shows the statistical summary for Domain F: Administration.

Table 12

Statistical Summary on Administration According to Faculty

	PISQ			PSD			Overall		
Administration	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Academic Administration	2.46	2	A	3.29	1	HA	2.88	1.5	HA
B. Student Administration	2.25	3	A	3.25	2	HA	2.75	3	HA
C. Financial Management	1.63	4	A	3.08	3	HA	2.36	4	A
D. Faculty Administration	2.75	1	HA	3.00	4	HA	2.88	1.5	HA
Average	**2.24**	**-**	**A**	**3.16**	**-**	**HA**	**2.70**	**-**	**HA**

Table 12 displays that in terms of administration, the Philippine schools in Qatar are ready but need few improvements to effectively implement the K to 12 Science Curriculum as indicated by its overall mean, 2.70 corresponding to highly attained.

Table M6 (see Appendix M) provides a more detailed data related to this domain which shows that academic and faculty administration were the top most sub-domains indicating that the school administrators provide teachers with opportunities for professional growth and development, 3.00, and encourage the attendance/participation of faculty in science related trainings and seminars, 3.13. Also, the teachers have high regard on the student administration which implies that the school administrators are providing students with opportunities to participate in the planning and implementation of science activities, acting promptly on the request, needs and problems of the students, and maintaining harmonious relationship with the students.

It is important that the school administrators are prepared for effective implementation of the new curriculum since they are the ones planning, managing and making decisions on major operational aspects of the school. All other areas of this study can also be addressed with the help of the administration.

Even if this domain received high ratings from the faculty, still the schools have to improve on this domain specifically in terms of financial management as its mean, 2.36, is the lowest among the 4 sub-domains under this area. In other words, financial management requires greater attention with emphasis on allocating funds for improvement of laboratory, repair and maintenance of facilities and equipment, purchase of new equipment, supplies and materials, participation in competitions and campaigns, and partnership with

organization/club, as these attributes received the lowest means out of 20 items under this domain. The poor funding of areas related to laboratory, facilities, equipment, materials, and participation in competitions/ campaigns/ organization/ club can adversely affect the effective implementation of the new curriculum since the focus of the K to 12 Science Curriculum is providing varied hands-on, minds-on and hearts-on activities to the students so they can see the usefulness and relevance of science in the society. Additionally, the issue on financial management can limit the potential of the other domains delaying the successful implementation of the new curriculum.

The Overall Readiness According to Faculty

Table 13 shows the mean summary of the readiness of Philippine schools in Qatar to effectively implement the K to 12 Science Curriculum according to the teacher-respondents.

Table 13

Overall Readiness According to Faculty

Domain	PISQ			PSD			Overall		
	M	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A: Physical Facilities	1.39	6	SA	2.38	6	A	1.89	6	A
B: Instruction	2.89	1	HA	3.20	3	HA	3.05	2	HA
C: Content	2.79	2	HA	3.33	2	HA	3.06	1	HA
D: Support to Students	2.56	3	HA	3.35	1	HA	2.96	3	HA
E: Library and Instructional Materials	1.90	5	A	2.43	5	A	2.17	5	A
F: Administration	2.24	4	A	3.16	4	HA	2.70	4	HA
OVERALL	**2.30**	**-**	**A**	**2.98**	**-**	**HA**	**2.64**	**-**	**HA**

Table 13 indicates that the Philippine schools in Qatar are ready for effective implementation of the K to 12 Science curriculum but need some improvement, as reflected on its overall mean, 2.64 interpreted as highly attained.

The findings revealed that the strength of both schools lies on their content, 3.06, instruction, 3.05, and support to students, 2.96.This gives an impression that both schools are investing significant amount of competence and encouragement to promote the learning of science. This also suggests that despite the issues identified, particularly regarding the physical facilities, library and instructional materials, the schools are doing their best to provide materials and services that would contribute to the effective delivery of science instruction. It is important that instruction and content are prepared for effective implementation of the new curriculum as they are the key factors in the teaching and learning of science. Also, the support to students through the various science programs and services provided by the school must be responsive to the requirement of the new curriculum as they aid its successful implementation by enriching and deepening the science skills of the students.

As mentioned, the Philippine schools in Qatar have to work on improving their physical facilities, 1.89, and library and instructional materials, 2.17, as both domains obtained the lowest overall means out of the 6 domains. The poor physical facilities, library and instructional materials have negative impact on the effective implementation of the curriculum since these components do not only serve as place where learning and teaching take place but they also encourage the active participation of the students and effective instruction of the teachers. It is important that the school's physical facilities and library are

comfortable, well ventilated, well illuminated and spacious to motivate the teachers provide learning experiences that are challenging and develop critical thinking to aid the acquisition of 21st century skills. Furthermore, the library collection, instructional materials and laboratory supplies/ materials/ equipment must be sufficient, modern and technology-oriented so students have the opportunity to engage on science investigations, link science and technology, construct explanations with evidences, and integrate science to other topics and disciplines addressing the globalized, spiral progression and inquiry-based features of the new curriculum.

Administrators' Evaluation of Schools' Readiness

The readiness for effective implementation of K to 12 Science Curriculum of Philippine Schools in Qatar in terms of physical facilities, instruction, content, support to students, library and instructional materials and administration as perceived by the administrator-respondents was identified and summarized on the following tables. Descriptive statistics such as frequency and percentage distribution, mean and standard deviation were used to identify the readiness of the Philippine schools in Qatar.

Domain A: Physical Facilities

Since the K to 12 Science Curriculum is student-centered and inquiry-based, the classrooms and science laboratories must be spacious, well-ventilated, well-illuminated and acoustically conditioned so it is conducive for classroom interactions like group work discussions and practical/ hands-on activities. Also, there must be enough and properly-working materials, equipment, apparatus and supplies like chemicals and reagents so

teachers will be encouraged to engage the students in science experiments making the instruction more learner-centered.

Table 14 shows the statistical summary for Domain A: Physical Facilities.

Table 14

Statistical Summary on Physical Facilities According to Administrators

Physical Facilities	PISQ			PSD			Overall		
	M	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Classrooms	3.50	1.5	EA	3.25	1	EA	3.38	1	HA
B. Science Laboratories	3.50	1.5	EA	2.70	2	HA	3.10	2	HA
C. Equipment, Materials and Supplies	3.38	3	HA	2.63	3	HA	3.01	3	HA
AVERAGE	**3.45**	**-**	**HA**	**2.77**	**-**	**HA**	**3.11**	**-**	**HA**

Table 14 displays that for the administrator-respondents the physical facilities of Philippine schools in Qatar are ready for the effective implementation of the new curriculum with some improvements to be done as indicated on its overall mean, 3.11 which has a verbal interpretation of highly attained. This is contrary to the assessment of the teachers where they gave an overall rating of 1.89 which corresponds to attained. This suggests that compared to the administrators, the HS Science teachers feel the necessity for more improvement in the school's physical facilities. This could be due to the fact that they are the ones using the school facilities for science instruction; therefore, they can clearly identify deficiencies under this domain that influence the quality of teaching and learning of science.

Table N1 (see Appendix N) shows that the classrooms of Philippine schools in Qatar are well lighted, ventilated and acoustically conditioned and are provided with enough furniture (tables and chairs) and equipment (TV, projector, speaker, etc.), as both obtained the highest mean, 4.00, under this domain. Similarly, the findings indicate that the science laboratories are properly lighted and well ventilated, has at least two exit doors that open

outward, with furniture/ equipment arrangement that allow free flow of movement and enables students to work comfortably without interference, and implement safety and precautionary measures, as these were the highly assessed attributes under the sub-domain, science laboratories.

Yet, it is reflected on the results that the classroom size is inadequate based on its overall mean, 2.00. Likewise, the results suggest that the science laboratories are not neat, clean and orderly and have no demonstration table equipped with sink, water, electrical and gas outlets; laboratory operation manuals for the faculty and students; and usable fire extinguishers, first aid kit, and other emergency materials, as these attributes obtained the lowest means under this subdomain. In terms of equipment, materials and supplies, Table N1 reveals that there are inadequate equipment, instruments and materials needed in the laboratory and lack of trained laboratory technician/ assistant for the proper upkeep of the laboratory.

It can be deduced from the findings that as far as the administrators are concern, the school is providing highly satisfactory physical facilities. However, improvements must be made on the size, neatness, materials, equipment and supplies of the classrooms and science laboratories. It is important that the school's physical facilities are spacious, well maintained and well equipped to provide the variety of learning settings necessary to successfully support student-centered and inquiry-oriented learning. Moreover, physical facilities have direct impact on the teaching strategies of the teacher for if there is no available space and insufficient materials, the teacher's desire to deviate from textbook and memorization of facts is prevented. As a result, the teacher will just resort to teacher-directed activities even

if the intention is to develop science processes and skills among the students because it will be easier on their part than managing the space and resources during an experiment.

Domain B: Instruction

The K to 12 Science Curriculum equipped students with the 21st century skills that are essential in this fast changing world, therefore the teachers should also utilize 21st century science teaching. The science pedagogy should involve hands-on activities, group discussions, problem solving and digital tools that require higher-order thinking skills and will develop students' deeper conceptual understanding of the science topics. Also, the curriculum is outcome-focused and develops inquiry skills, thus assessment should be through inquiry-based practical works, assignments and projects; and based on understanding of science concepts and processes.

Table 15 shows the statistical summary for Domain B: Instruction.

Table 15

Statistical Summary on Instruction According to Administrators

	PISQ			PSD			Overall		
Instruction	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Teaching Method and Techniques	3.19	1	HA	3.04	2	HA	3.12	2	HA
B. Assessment of Academic Performance	3.00	2	HA	3.89	1	EA	3.45	1	HA
OVERALL	**3.14**	**-**	**HA**	**3.26**	**-**	**HA**	**3.20**	**-**	**HA**

Table 15 indicates that in terms of instruction the Philippine schools in Qatar are ready for the effective implementation of the K to 12 Science curriculum with some improvements to be made based on its overall mean, 3.20, interpreted as highly attained.

It is reflected on Table N2 (see Appendix N) that the students are being assessed through various ways like formative tests such as quizzes, unit test; summative tests such as mid- quarterly and quarterly examination; projects, performance tests/ practical tests and reflection/ reaction papers, as most of these assessment methods were highly appraised by the administrator-participants. This is an indication that the teachers are assessing the students' performance not only through written tests like quizzes but also make use of performance-based and outcome-based assessment techniques like projects, performance tests/ practical tests and reflection/ reaction papers. Also, it shows that the assessment is not for summative purposes only but also for formative purposes which is in accordance with the requirement of the new curriculum.

However, it is noteworthy that the administrator-respondents lowly rated items related to teaching methods and techniques. This is an indication that there is a need for teacher education and professional development for continuous updating specifically in terms of content-knowledge and skills for teaching by inquiry. Teachers require constant updating to have sufficient knowledge of science content because in the new curriculum the different sciences are integrated from grades 7 to 10. Teaching skills and practices should also be transformed to make the classroom instruction less teacher-dominated but more student-centered.

Domain C: Content

The purpose of the K to 12 Science curriculum is to develop scientific literacy among the students so that they understand the health, environmental and social relevance of

science, hence they can contribute to the solution of everyday issues and make informed decisions.

Based on the assessment of the administrator-participants, the Philippine schools in Qatar are ready for the effective implementation of the new curriculum in terms of content with few improvements to be done as indicated by its overall mean, 3.00 which corresponds to highly attained. It can be inferred that the administrator-respondents are confident that the content promotes the development of environmentally, scientifically and technologically literate students that are able to make rational decisions on real-world problems using scientific inquiries and relevant technologies. However, the delivery of the content of the science curriculum should be improved so that the core goals of the new curriculum will be successfully realized. Thus, the school should invest on the education of the teachers who have direct contact with the students and the ones who give life to the science content.

Domain D: Support to Students

Realuyo (1994), emphasized the value of a developed science program which serves as training ground of our potential scientists. To him, "the scientists of tomorrow are in our schools today". The school, therefore, should provide different science related activities and open opportunities for the students to join in regional/district/international science competitions/ organizations/ campaigns to develop their science competencies and translate these learnings into real-life situations.

Table 16 shows the statistical summary for Domain D: Support to Students.

Table 16

Statistical Summary on Support to Students According to Administrators

Support to Students	PISQ			PSD			Overall		
	M	***RANK***	***VI***	***M***	***RANK***	***VI***	***M***	***RANK***	***VI***
A. Student Programs and Services	3.00	1.5	HA	3.78	1	EA	3.39	1	HA
B. Student Development	3.00	1.5	HA	3.00	2	HA	3.00	2	HA
Average	**3.00**	**-**	**HA**	**3.54**	**-**	**EA**	**3.27**	**-**	**HA**

The Philippine schools in Qatar in terms of support to students, are ready but need few improvements for the effective implementation of the K to 12 Science Curriculum as shown in its overall mean, 3.27 which is equivalent to highly attained. This implies that the administrator-respondents are highly satisfied with the science programs and services given to the students.

It is reflected in Table N4 (see Appendix N) that the school regularly conduct science activities (quiz bee, research, exhibit, etc.), science organizations, science trainings, educational tours/ learning visits/ etc.; symposia, seminars, workshops, professional lectures, and encourage participation in regional/ district/ international science competitions and organizations/campaigns based on their mean, 3.50 which is interpreted as excellently attained. This suggests that students are given opportunities to experience science in context and to interact with other experts or learners.

However, Table N4 (see Appendix N) reveals that there is inadequate funding, insufficient physical facilities, equipment and materials; and no clear policies and procedures of student recruitment, selection, and admission for science activities and programs. This suggests that the schools must allocate more funds and must develop clear guidelines for the conduct of different science activities and programs. It is important that there are different

science related activities inside or outside the school for exposure to these would aid in the acquisition of the 21st century skills and these are other means to make the instruction more contextualized and globalized.

Domain E: Library and Instructional Materials

The K to 12 Science Curriculum aimed to train the students to formulate solutions/ answers to real-life issues/ problems supported by evidences, and the library is necessary to perform tasks to attain the objectives of the lessons. In addition, the library supports the teaching and learning of science by making numerous and varied resources, print and non-print, be made available to the teachers and students during science research. Thus, it is necessary that the school library has a variety of resources; print and non-print, digital and electronic, significant in the science teaching and learning.

Table 17 shows the statistical summary for Domain E: Library and Instructional Materials.

Table 17

Statistical Summary on Library and Instructional Materials According to Administrators

Library and Instructional Materials	PISQ			PSD			Overall		
	M	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Collection Development, Organization and Preservation	3.25	2	HA	3.00	2	HA	3.13	2	HA
B. Services and Utilization	2.80	3	HA	3.80	1	EA	3.30	1	HA
C. Physical Set- Up and Facilities	3.33	1	HA	2.83	3	HA	3.08	3	HA
Average	**3.13**	**-**	**HA**	**3.20**	**-**	**HA**	**3.17**	**-**	**HA**

Table 17 indicates the administrator-respondents gave a highly attained rating, 3.17, indicating that in terms of library and instructional materials the Philippine schools in Qatar are ready for the effective implementation of the K to 12 Science Curriculum with some improvements to be done. However, this finding is in contrasts with the assessment of the faculty-respondents, where they gave a 2.17 rating for this domains which is equivalent to attained. This implies that there are resources and services the faculty-participants need for their teaching that are not available in the school library.

The library of both schools, as shown in Table N5 (see Appendix N), has quality and quantity of science books and materials that conform with the needs of the students and teachers, offer inventory reporting and internet searching; is strategically located and accessible to the clientele; and has atmosphere that is conducive to learning. This is an indication that the library of both schools can cater the information needs of the students and teachers.

Although, the result indicates that the library of PISQ and PSD is ready for the effective implementation of the new curriculum, still there are issues that need to be addressed such as inadequate space, poor ventilation and lighting; and unavailability of updated resources and reliable services like OPAC, photocopying and internet searching. Since the new curriculum is spiral progression and emphasized the use of evidence to support explanation, the use of the prescribed textbook during class discussion will not suffice, thus the quality and availability of library resources and services are important in addressing the increasing demand for information of the students and teachers.

Domain F: Administration

The school administrators supervise the implementation of the curriculum by managing the academic and extra-curricular needs of the students; instruction and education of the faculty; and finances for acquisition, improvement and maintenance of school's facilities, equipment and equipment. Therefore, the school administrators have a great responsibility for the effective implementation of the new curriculum.

Table 18 shows the statistical summary for Domain F: Administration.

Table 18

Statistical Summary on Administration According to Administrators

	PISQ			PSD			Overall		
Administration	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Academic Administration	4.00	1	EA	4.00	1.5	EA	4.00	1.5	EA
B. Student Administration	4.00	1	EA	3.67	3	EA	3.84	3	EA
C. Financial Management	4.00	1	EA	3.17	4	HA	3.59	4	EA
D. Faculty Administration	4.00	1	EA	4.00	1.5	EA	4.00	1.5	EA
Average	**4.00**	**-**	**EA**	**3.70**	**-**	**EA**	**3.85**	**-**	**EA**

Based on the overall mean of 3.85 which is equivalent to excellently attained, the administrators of Philippine schools in Qatar are ready for the effective implementation of the K to 12 Science Curriculum.

It is shown in Table N6 (see Appendix N) that the administrators are highly confident with their academic and faculty administration, as both obtained the highest mean, 4.00 out of the 4 subdomains. This finding is the same with the assessment of the faculty-participants indicating that the administrators are committed in supervising the teachers and responsive to the academic needs of the students.

The findings also indicate that the fund allocated for improvement of laboratory, repair and maintenance of facilities and equipment; purchase of new equipment, supplies and materials; and participation in competitions/ campaigns and organization/ club must be improved. This is consistent with the evaluation of the faculty-respondents which is a clear indication of issues on managing the school fund for science related facilities and programs. This issue must be addressed because poor financial management can also affect the entire well-being of the school like inadequate supply of instructional materials, lack of laboratory equipment and supplies, outdated library resources and poor physical facilities which are all needed by teachers to intensify science instruction.

Administrators' Overall Evaluation

Table 19 shows the mean summary of the readiness of Philippine schools in Qatar for effective implementation of K to 12 Science Curriculum towards the different domains according to the administrator-respondents.

Table 19

Overall Readiness According to Administrators

	PISQ			PSD			Overall		
Domain	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A: Physical Facilities	3.45	2	HA	2.77	6	HA	3.11	5	HA
B: Instruction	3.14	3	HA	3.26	3	HA	3.20	3	HA
C: Content	3.00	5.5	HA	3.00	5	HA	3.00	6	HA
D: Support to Students	3.00	5.5	HA	3.54	2	EA	3.27	2	HA
E: Library and Instructional Materials	3.13	4	HA	3.20	4	HA	3.17	4	HA
F: Administration	4.00	1	EA	3.70	1	EA	3.85	1	EA
OVERALL	**3.29**	**-**	**HA**	**3.25**	**-**	**HA**	**3.27**	**-**	**HA**

As shown in Table 19 the Philippine schools in Qatar as perceived by the administrator-participants are ready but need few improvements for the effective implementation of the new curriculum as reflected on its overall mean, 3.27, interpreted as highly attained.

Based on Table 19, Domain F: Administration obtained the highest mean, 3.85, which implies that the administrators are certain with their leadership competency to effectively implement the K to 12 Science Curriculum. This is followed by support to students, 3.27, and instruction, 3.20. The instruction above all the domains must conform to the changes in the curriculum because still the main goal of curriculum implementation is the learning of the students. Additionally, the education of the students is the main reason why the curriculum was developed. Therefore, the school's support to students through various science related programs and services are also important in making the instruction more contextualized and globalized.

Although, the rating given by the administrators is highly attained, there are still room for improvement specifically towards the school's library and instructional materials; and physical facilities. These two areas are vital in the effective implementation of the K to 12 Science Curriculum since the curriculum is learner-centered and inquiry-based. The library with varied instructional materials and learning resources provide access to other disciplines which will encourage the students to be independent learners and will enable them to intensify their scientific research. Similarly, the school's physical facilities with emphasis on the science laboratories and equipment drive the teachers to design varied, interactive and hands- on activities that will make the teaching of science inquiry-oriented.

As a result, the students appreciate science as beneficial and significant in real-life scenarios which is the ultimate goal of the K to 12 Science Curriculum.

Challenges Encountered by the Philippine Schools in Qatar

Table 20 presents the challenges encountered by the students, faculty and administrators that affect the effective implementation of the K to 12 Science Curriculum.

Out of 277 student-respondents from PISQ, only 121 answered this part of the questionnaire, the remaining 156 abstained from answering. Likewise, only 1 out of 4 teachers responded to this question. On the other hand, only 143 out of 281 student-participants from PSD responded this question, the remaining 138 refrained from answering. Similarly, only 3 out of 4 teachers answered this question. The administrator-respondents of both schools responded to this question.

In terms of physical facilities, the stakeholders identified disappointments with the size, ventilation, chairs/ tables, and cleanliness of their classroom/ science laboratories. Another concern is the absence of science laboratories and insufficient/ damaged laboratory equipment/ materials. Some students even expressed that due to many enrollees, science laboratories were turned into classrooms. As a result, they seldom, if not total absence, perform experiments. However, there were some students who stated that despite inadequate/ broken laboratory materials/ equipment, their teachers are trying their best to have hands-on experiments but the procurement of the materials are being shouldered by the students. The poor ventilation was specified to be due to the number of students in a classroom. Additionally, the dirty classroom/laboratory is also another problem due to the air-conditioning units that are not working properly.

Table 20

Frequency Distribution of Challenges Encountered According to Administrators, Faculty, and Students

Challenges Encountered	PISQ			PSD			Overall		
	S	F	A	S	F	A	S	F	A
Physical Facilities									
Small classroom/ laboratories	53	0	0	41	3	1	94	3	1
Insufficient ventilation	33	0	0	54	0	0	87	0	0
Broken/ uncomfortable chairs/ tables	27	0	0	44	0	0	71	0	0
Unavailability of Science laboratories	36	0	1	31	0	0	67	0	1
Dirty classrooms/ laboratories	26	0	0	0	0	0	26	0	0
Inadequate/ broken laboratory equipment/ materials	69	1	0	44	0	1	113	1	1
Instruction									
Teachers not supportive/ patient	16	0	0	15	0	0	31	0	0
Fast/ complicated/ unclear teaching/ instruction	70	0	0	31	0	0	101	0	0
Not discussed test items	11	0	0	0	0	0	11	0	0
Favoritism	11	0	0	0	0	0	11	0	0
Books not maximized/ not updated	37	0	0	44	0	0	81	0	0
Rare/ no experiment/ hands-on activities	40	0	0	0	0	0	40	0	0
Teacher not knowledgeable in specific science topic	16	0	0	0	1	0	16	1	0
Limited/ broken instructional materials/ resources	27	0	0	48	0	0	75	0	0
Limited contact time	16	0	0	0	0	0	16	0	0
Support to Students									
Support is limited	25	0	0	2	0	0	27	0	0
No time for after class consultation	0	0	0	0	1	0	0	1	0
Library and Instructional Materials									
Small library	35	0	0	24	0	0	59	0	0
Unavailable/ poor computer/ internet connection/ photocopier	26	0	0	21	0	0	47	0	0
Outdated/ limited science related/ k-12 compliant books	32	0	0	18	2	1	50	2	1
Librarian not approachable	13	0	0	0	0	0	13	0	0
Not properly ventilated	12	0	0	11	0	0	23	0	0
Difficulty in locating books (OPAC)	15	0	0	26	0	0	41	0	0
Limited time for printing/ library work	0	0	0	21	1	0	21	1	0
Administration									
Admin not approachable/ communicating	5	0	0	5	0	0	10	0	0
Funding	7	0	0	0	0	0	7	0	0
Lack of science related activities	4	0	0	3	0	0	7	0	0
Short notice/ announcement of activities	0	0	0	2	0	0	2	0	0
Total	662	1	1	485	8	3	1147	9	4

Note: S= Students; F= Faculty; A= Administrator

The K to 12 Science Curriculum was designed with the desire to engage the students to varied minds-on, hearts-on and hands- on activities, however, the data imply that the strategies of the teachers in teaching science are being restricted due to poor size, ventilation,

chairs/ tables, and cleanliness of their classroom/ science laboratories. Students also expressed that their teachers tend to use lecture most of the time, making the class boring which is a total contrary to the desire of the K to 12 Science Curriculum which is to establish a learner-oriented and inquiry-based instruction. This is due to the fact that Science is learned best when students are active in the learning process. Students should be encouraged to work with concrete objects and events so that they can put into concrete happenings the theories and concepts they learn in science (Dobey, 2004). But the lack of science laboratories combined with insufficient equipment, tools and apparatus; and poor supply of water and electricity can discourage any teacher with willingness to perform any hands- on experiment (Bentilio, et.al., 2003). As a result, the effective implementation of K to 12 Science Curriculum is hindered.

In terms of instruction, the students find issues on the attitude of the teachers such as not being supportive, patient and fair. The students specified that their teacher easily gets angry and only supports students who are intelligent. The word "favoritism" came out from the students' responses. It was also noteworthy that a number of students find the delivery of instruction of their teachers fast, complicated and unclear. They specifically attributed this concern with the soft voice of the teacher and described their teacher as "rushing". They also indicated that their textbook is not being maximized and that there are some test items that were not discussed. The competency of the teacher to teach science was also seen as a concern. A student detailed, to quote "when my science teacher left in the middle of the school year, she was replaced by a teacher from NKP which was not suitable". Additionally, a teacher-respondent admitted that she still has to study physics since this is not her major.

Furthermore, the students noticed that their teacher is not using varied or interactive learning materials to enrich the teaching and learning of science. To quote, "more lecture, no interaction". This is still a result of the highlighted problem of lack of instructional materials and resources.

As discussed in the previous part of this chapter, domain B: Instruction was highly assessed by the stakeholders of both schools. However, the responses of the students to this part of the questionnaire clearly presented the real picture of science instruction of our Philippine schools in Qatar. It is disappointing that the competencies and strategies of the teachers were raised as concerns by the students. The issues regarding instruction that were identified can adversely affect the effective implementation of K to 12 Science Curriculum. Research shown that class activities and teaching strategies in science have a positive correlation with the attainment of curriculum objectives. Thus, teaching instruction is a crucial indicator of the effectiveness of implementation of any curriculum.

In terms of support to students, the students find it limited only to students the teachers or administrators know. And the data showed that a teacher of PSD has a desire to extend her help to the students even after class hours.

The limited support of the school in terms of organizing and funding of science related activities such as educational tours, science trainings, workshops, science competitions and campaigns to the entire student body, can limit the effective implementation of K to 12 Science Curriculum. The school should provide venue for the appreciation of science among the students, for the new curriculum puts emphasis on

inculcating to the students the relevance and usefulness of science on the work place and in a knowledge-based society.

In terms of library and instructional materials, the table reveals that the stakeholders are concern with the space, ventilation and availability of resources/ services in the library. Students from PISQ stated that the library is small and cannot accommodate 2 sections at the same time. They described that due to inadequate space, students are forced to sit on the floor during their library period. Also, they expressed that they are uncertain whether there is really an internet connection since whenever they use the computer to research it is always disconnected. Moreover, they find the collection of the library outdated and most are not K to 12 compliant. In addition, the librarian of PISQ was found to be unapproachable by the students. To quote, "she is not smiling" and "always angry". The students of PSD have similar concerns, but put emphasis on the schedule of printing and other library services that does not match with their class schedule.

Since the new curriculum stressed the value of evidences in science discussions, the library is an important asset in the effective implementation of K to 12 Science Curriculum. Yet, the feedback that the library has insufficient space and ventilation, limited and outdated collection; and poor services and staff can discourage the students to engage in science research and reading. As a result, they will just use one reference which is their textbook and will just rely on the inputs of their teachers. This will clearly defeat the purpose of K to 12 Science Curriculum, which is to develop students who are responsible of their own education and learners who are collaborating, questioning and investigating to formulate solutions/ answers to real-life problems/ issues.

In terms of administration, there is uncertainty from the students and parents regarding the use of school fund. To quote, “not using fund to improve the school”. This could be due to the lack of science facilities and equipment; and science-related activities. They also view the administrators as unapproachable and not communicating with them.

The role of school administrators in encouraging the acquisition and utilization of science equipment is crucial (Beasely, 1999). Additionally, Amansec (1997) emphasized that it is the task of the administration to monitor the quality of instruction and provide conducive environment to motivate the students to learn. Thus, the low confidence of the parents to the school administrators can negatively affect the effective implementation of the new curriculum, this may result to non-involvement of the parents in any activities of the school that specifically involves money which may hinder the accomplishment of any developmental program for the benefit of their children due to lack of fund. Additionally, their disappointments may be echoed to the students that will cause discouragement from their end to engage in any school activities and program. Therefore, the school administrators should act appropriately to eliminate the doubt of the parents regarding the use of school fund.

Strategic Plan for Effective Curriculum Implementation

Table 21 presents the strategic plan for the Philippine Schools in Qatar for the effective implementation of the K to 12 Science Curriculum. The actual conditions of the Philippine schools in Qatar are based on the findings of the study. While, the ideal pictures were based on the reports, articles and studies provided by teachers and other key holders in science education.

Since the new curriculum encourages learner-centered practices and inquiry-based approaches, the schools' physical facilities should be responsive to the changes in teaching strategies and learning activities. In addition to being comfortable, safe, secure, accessible, well-illuminated, well-ventilated and aesthetically pleasing, the physical facilities must be more student-centered, developmentally and age appropriate. Also, the science laboratory resources like chemicals, reagents, equipment and apparatus should be sufficient, modern and properly-working. It is also ideal if there is an available laboratory assistant or custodian to make science experiments less tedious for teachers. However, based on the findings the Philippine schools in Qatar have non-conducive science environment as there is insufficient ventilation, overcrowded and unclean classrooms/ laboratories, broken chairs/ tables, and lack of well-equipped science laboratories. Thus, the school administrators must build new classrooms and laboratories that are spacious with at least two exits and doorways for easy access during science activities and emergencies and to reduce the class sizes that will result to well-ventilation devoiding noise and distractions. There should also be mechanisms for regular acquisition, monitoring and maintenance of school's facilities, furniture and equipment. The school may also look into the possibility of hiring skilled laboratory custodian or assistant to help the teacher during science activities.

The science pedagogy in the new curriculum should involve practical and activity work, whole/ small group discussions, experimentation and problem-solving to promote investigation and exploration. While, assessment should consist more of projects, assignments and practical work for the science curriculum is standards/ competence-based and outcome-based. Therefore, the teachers should have good pedagogical skills for teaching

by inquiry and have rich subject matter knowledge of all sciences since the new curriculum is spiral progression. Also, the teachers should be resourceful to relate the classroom activities to the local environment as the new curriculum is contextualized and globalized. Yet, as reflected on the responses of the students, the schools lack qualified, knowledgeable and skilled science teachers. Thus, the Philippine schools in Qatar must involve teachers to in-service trainings with focus on teaching methodology and other important aspect of science teaching. The teachers must also be encouraged to be registered and active members of professional/ science associations, attend trainings sponsored by the DepEd, CHED and other agencies, and pursue ongoing professional learning and collaboration with colleagues and experts on science teaching and practice.

In terms of support to students, what is ideal is that students are exposed to different science related activities such as educational tours/ learning visit, science campaigns/ competitions, science trainings/ workshops, etc. so they can interact with other students and outside community to deepen their science knowledge and skills. But the students' responses revealed that Philippine schools in Qatar have limited participation on science related activities, hence the range of extra-curricular activities like educational tours, lecture, convention, competitions and campaigns must be extended so students are given opportunities to reflect the usefulness and relevance of science to the society.

Ideally, the school library should have a reading area or a work room that can accommodate a seating capacity of 10% of the total student population, have equipment and services that will support and reinforce the curriculum and meet the needs, abilities and interests of the students, and have adequate and modern science resources that are aligned

with the curriculum including print and non-print, electronic and digital resources. As reflected on the answers of the respondents, the actual condition of the school library of Philippine schools in Qatar is it is small and not well-ventilated, has limited services like computer/ internet connection, photocopier and online-public access (OPAC), and has outdated and insufficient resources including science related/ K to 12 compliant books, print and non-print, electronic and digital. Due to these circumstances, it is advised that the Philippine schools in Qatar increase the size of their school library, establish additional technological facilities, review, acquire and update instructional materials and library resources, provide access to more science related software, and develop systems to monitor and evaluate library's and librarian's effectiveness.

Based on the findings of this study, there is a problem on the allocation of funds for science facilities, programs and services. This should not be the case as there should be enough fund allotted for the acquisition, improvement and maintenance of science facilities, resources, programs and services. Therefore, the school administrators must give greater attention on allocating more funds for building new classrooms and science laboratories so that class sizes can be reduced, acquiring chemicals, reagents, apparatus and equipment for regular maintenance of laboratories, and purchasing quality books, references and teaching materials for the library.

Table 21

Strategic Plan for Effective K to 12 Science Curriculum Implementation

Ideal	Actual	Actions to be taken
Physical Facilities		
The school facilities should be responsive to the changes in curriculum like being more learner-centered, developmentally and age appropriate. The physical facilities should be comfortable, safe, secure, accessible, well-illuminated, well-ventilated and aesthetically pleasing.	Non-conducive science environment like insufficient ventilation, overcrowded and unclean classrooms/ laboratories.	• Build new classrooms and laboratories to have manageable class sizes and well-ventilation that devoid noise and distractions. • Construct classrooms and laboratories that are spacious and have at least two exits and doorways so the teacher can easily move around and supervise the students during science activities and for easy access during emergencies.
Science laboratories and equipment should be regularly maintained. And there should be comfortable chairs and tables for all students.	Lack of maintenance of school facilities like broken chairs/ tables, leaking air-conditioning unit and dirty classrooms/ laboratories.	• Set-up mechanisms for monitoring and regular maintenance of school's facilities, furniture and equipment.
There should be sufficient, modern and properly-working laboratory resources like chemicals, reagents, equipment and apparatus; and available assistant or custodian to make science experiments less tedious for teachers.	Lack of well-equipped science laboratories specifically inadequate/ broken laboratory resources like chemicals, reagents, equipment and apparatus.	• Purchase new equipment and apparatus. • Purchase laboratory tables that allow multiple arrangements and combinations for laboratory work and small-group activities and demonstration table that has sink with faucet, source of heat, such as gas or hot plate, electric power for equipment and computers.

		• Construct cabinets for display and storage of different chemical, supplies, equipment and apparatus needed in teaching earth science, biology, chemistry and physics addressing the spiral progression feature of the curriculum. • Hire skilled laboratory custodian or assistant to help the teacher during science activities.
Instruction		
The science curriculum is learner-centered and inquiry-oriented, therefore science pedagogy should involve practical and activity work, whole/ small group discussions, experimentation and problem-solving to promote investigation and exploration.	Poor teaching skills and approaches. Science teaching is more on lecture and students rarely engage in hands-on practical and activity work affecting the students' interest in science.	• Update teaching strategies that address 21st century skills of the students through in-service trainings and seminar/ workshops. • Device policy for formal monitoring of effective teaching learning activities. • Intensify the use of teacher-made instructional materials like worksheets, laboratory activity sheets, handouts and audio-visual presentation that integrating the K to 12 science competencies. • Realign learning activities with available instructional materials and K to 12 Enhanced Program.
The science curriculum is standards/ competence-based and outcome-based, thus assessment should involve more projects, assignments	Assessment based on memorization of factual science concepts through written tests and quizzes, thereby making science learning to be teacher-centered and didactic.	• Integrate performance-based tasks based on the students' learning styles. • Adapt assessment methods that are more authentic and student-centered.

and practical work to evaluate science skills and understanding of science concepts and/ or processes.		• Focus on objectives in the curriculum linking them to measureable improvements in students' attainment. • Purchase software, materials or equipment with the capacity to test students' skills and understanding.
The teachers should be well qualified, have good pedagogical skills for teaching by inquiry and have rich subject matter knowledge of all sciences since the new curriculum is spiral progression. Also, the teachers should be resourceful to relate the classroom activities to the local environment as the new curriculum is contextualized and globalized. Therefore, teachers should be regularly attending seminars, workshops and conferences, and involved in research activities and professional organizations to update their knowledge.	Schools lack qualified, knowledgeable and skilled science teachers. And teachers lack opportunities for professional learning.	• Involve teachers to in-service trainings on teaching methodology and other important aspect of science teaching. • Send teachers to seminar, congress, symposia, workshop and conferences sponsored by the DepEd, CHED and other agencies. • Provide teachers with sufficient opportunities for ongoing professional learning and for collaboration with colleagues and experts on science teaching and practice. • Encourage teachers to be registered and active members of professional/science associations.
Support to Students		
The school should provide students with opportunities to interact with the outside community.	Limited participation on educational tours/ learning visit, science campaigns/ competitions, science trainings/ workshops, etc.	• Extend the range of extra-curricular activities like educational tours, lecture, convention, competitions and campaigns to reflect the usefulness

		and relevance of science to the society.
Library and Instructional Materials		
The school library should provide a reading area or a work room that can accommodate a seating capacity of 10% of the total student population.	The library is small and not well-ventilated.	• Increase the size of the library to be as flexible as possible and to provide various arrangements for student seating.
The library should have equipment and services that will support and reinforce the curriculum and meet the needs, abilities and interests of the students.	The library has limited services like computer/ internet connection, photocopier and online-public access (OPAC).	• Establish additional technological facilities to encourage the use of information technology to enable students' own learning and meet the needs of increasing class sizes.
There should be adequate and modern science resources that are aligned with the curriculum including print and non-print, electronic and digital resources; and books that are K to 12 compliant.	The science curriculum resources are outdated and insufficient including science related/ K to 12 compliant books, print and non-print, electronic and digital resources.	• Review instructional materials and library resources and update based on the students' needs and changes in the curriculum. • Acquire adequate and updated reference materials that address the intended learning outcomes. • Provide access to more science related software to widen the learning opportunities of the students and teachers. • Develop systems to monitor and evaluate library's and librarian's effectiveness.

Administration		
There should be enough fund allocated for the acquisition, improvement and maintenance of science facilities, resources, programs and services.	There is not enough funding for science facilities, programs and services.	• Allocate more funds for building new classrooms and science laboratories so that class sizes can be reduced. • Allot sufficient funds to equip the laboratories with chemicals, reagents, apparatus and equipment for regular maintenance of laboratories, and to provide quality books, references and teaching materials for the library.

CHAPTER 5

Summary, Conclusions and Recommendations

This chapter presents the significant findings based on the gathered data. Conclusions drawn, as well as recommendations forwarded are also included in this chapter.

Summary of Findings

The following are the findings of the study:

1. The overall readiness for effective implementation of K to 12 Science Curriculum of Philippine Schools in Qatar based on the students' responses is "highly attained", which implies that the schools are "ready but need some improvement" to effectively implement the new curriculum. Similarly, according to the administrator-respondents, 3.27, and faculty, 2.64, the Philippine schools in Qatar are "ready but needs a few improvements", as reflected on its overall mean interpreted as "highly attained".

In terms of physical facilities, the administrator-respondents and student-participants perceived it to be "highly attained" which corresponds to "ready but needs a few improvements". On the contrary, the faculty assessed it as "attained" which is equivalent to "within the expected level of readiness".

In terms of instruction, the students, administrator-participants and faculty-respondents viewed it as "highly attained" which is an indication that the schools are "ready but needs a few improvements".

In terms of content, the faculty and administrator-respondents have the same assessment which is "highly attained", indicating that the schools are "ready but needs a few improvements".

In terms of support to students, the rating given by the faculty and administrator-respondents is "highly attained" which is equivalent to "ready but needs a few improvements". However, this domain obtained an overall rating of "attained" from the student-respondents which is an indication that the schools are "within the expected level of readiness".

In terms of library and instructional materials, this domain obtained an overall rating of "attained" from the faculty which corresponds to "within the expected level of readiness". Contradictory, the administrators and students perceived this domain as "highly attained" which is equivalent to "ready but needs a few improvements".

And in terms of administration, this domain is "ready but needs a few improvements" as assessed by the faculty and as reflected on its overall rating of "highly attained". On the other hand, this domain is perceived to be "excellently attained" by the administrator-respondents which suggests that this domain is "ready to go ahead" to effectively implement the new curriculum.

2. The stakeholders identified issues towards the school's physical facilities, instruction, support to students, library and instructional materials; and administration.

In terms of physical facilities, the students identified disappointments with the size, ventilation, chairs/ tables, and cleanliness of their classroom/ science laboratories. Another concern is the absence of science laboratories and insufficient/ damaged laboratory equipment/ materials.

In terms of instruction, the students have issues on the attitude of the teachers such as not being supportive, patient and fair. It is also noteworthy that a number of

students find the delivery of instruction of their teachers fast, complicated and unclear. They also indicated that their textbook is not being maximized and that there are some test items which were not discussed. The competency of the teacher to teach science was also seen as a concern. Furthermore, the students noticed that their teacher is not using varied or interactive learning materials to enrich the teaching and learning of science.

In terms of support to students, the students feel that the school only extend their support to students they know.

In terms of library and instructional materials, the data shows that the students and teachers are concerned with the space, ventilation and availability of resources/ services of the library. There are also issues regarding the services the library offered such as internet searching, printing, and photocopying which are not always available during office hours. Additionally, materials are outdated and do not comply with the K to 12 Science Curriculum and the library staff is also unapproachable.

In terms of administration, due to the lack of science facilities and equipment and science related activities the students developed distrust regarding the use of school fund. Also, the administrators were seen to be unapproachable and do not communicate with the parents.

3. A strategic plan was developed to summarize the ideal and current situation of the Philippine schools in Qatar and to identify actions that can be taken to overcome

the challenges inhibiting the effective implementation of the K to 12 Science Curriculum.

In a nutshell, instead of having physical facilities that are responsive to the changes in the curriculum, comfortable, accessible, well illuminated and well ventilated; the physical facilities of Philippine schools in Qatar have non-conducive science environment, lack maintenance and are poorly-equipped. Therefore, there is a need for construction of new and spacious classrooms and science laboratories, development of mechanisms for monitoring and regular maintenance of school facilities and acquisition of new equipment and apparatus.

Ideally, the instruction in the new curriculum must be learner-centered and inquiry-oriented, assessment is standards/ competence-based and outcome-based; and is facilitated by well qualified teachers. However, at present the science teaching is more on lecture and students rarely engage in hands-on activity work, assessment is based on memorization of factual science concepts and schools lack qualified, knowledgeable and skilled science teachers. Therefore, the school must involve the teachers in trainings and seminar/workshops about 21st century science teaching approaches, integrate performance-based tasks and provide teachers with sufficient opportunities for ongoing professional learning and for collaboration with colleagues and experts on science teaching and practice.

Towards support to students, the school should provide students with opportunities to interact with the outside community but the actual condition is that the school offers limited participation on educational tours/learning visit, science

campaigns/ competitions, science trainings/ workshops, etc. Thus, the schools must extend the range of their extra-curricular activities so students can see the usefulness and relevance of science to the society.

The ideal school library is spacious, have equipment and services that will support and reinforce the curriculum; and have adequate and modern science resources that are aligned with the curriculum. Contradictory, the library of Philippine schools in Qatar is small and not well-ventilated; and offers limited services and outdated resources. Hence, the library must expand, establish additional technological facilities, and acquire adequate and updated reference materials.

Ideally, there should be enough fund allocated for science facilities, equipment and supplies through the effort of the school administrators, however at present there is not enough funding for science facilities, programs and services. For that reason, the administrators must allocate more funds for conduct of science activities and programs; and for acquisition and maintenance of science facilities and materials.

Conclusions

Based on the findings, this research investigation draws the following conclusions:

1. The Philippine schools in Qatar have potential to deliver quality education but their readiness to effectively implement the K to 12 Science Curriculum is still at the borderline. The readiness of the teachers is noteworthy which can bring success to the effective implementation of the new curriculum for effective teachers cannot only deliver the content of the curriculum but can also modify it depending on the needs,

abilities and interest of the students. However, the support given to the students through various science related services and programs; the schools' physical facilities, and library and instructional materials were poor. Thus, there are rooms for improvement in major aspects of the school which can be attributed to the fact that the K to 12 Science Curriculum is still new and there are restrictions set by the host country which affect the schools effort to improve and update all the domains.

2. The effective implementation of the new curriculum by the Philippine schools in Qatar is deter by having inadequate physical facilities and outdated instructional materials that cause instruction to be teacher-dominated instead of being learner-centered and inquiry-oriented. Also, the limited opportunity for professional trainings and studies negatively affect the instruction and competency of the teachers. Thus, effective interventions with focus on developing teachers' competency, school facilities and resources must be put in place to ensure more conducive learning environment and more meaningful learning experience for the learners.

3. Although, there are areas that show compliance to the characteristics of an ideal science education, still the Philippine schools in Qatar should build new classrooms and laboratories that are spacious, purchase new equipment/ apparatus and supplies, update teachers' science content knowledge and pedagogy through trainings/ seminar/ workshops, adapt assessment methods that are more authentic and student-centered, extend the range of extra-curricular activities, establish additional technological facilities, acquire adequate and updated reference materials; and allot sufficient funds for improvement and maintenance of science facilities and conduct of

science services and programs. By doing so they can maximize the potential of the school to effectively implement the new curriculum which will also result to the increase in students' learning achievement.

Recommendations

Based on the foregoing summary of findings and conclusions drawn, the following recommendations were made.

1. Classrooms, laboratories and library have to be improved with emphasis on the space, cleanliness, ventilation; and comfortable chairs and tables to make sure that the students are being provided with a conducive learning environment. It should be understood that Ergonomics is also important in the educational setting. Also, major advancement in the instructional materials and library collection such as provision for internet facilities and technology- integrated instructions is required to acquire 21st century skills needed by the students to be globally competitive. Moreover, the support from the administration in terms of planning, implementation and supervision of different science related activities; and acquisition, upgrading and maintenance of laboratories, equipment, tools and apparatus, need to be increased.

2. The science teachers must be encouraged to constantly update themselves with the new trends, modalities and strategies in science teaching. This may be achieved by pursuing graduate or post- graduate education to upgrade their competencies. The school administration may also provide seminars and trainings not limited to 21st

century teaching strategies and performance-based assessment but also about classroom management.

3. The instrument used in the study can be continuously improved to identify more accurately the effectiveness of the implementation of the K to 12 Science Curriculum of any Philippine school. Moreover, to disclose the actual condition of science teaching and learning in any Philippine schools, triangulation of data from several sources such as the scores and grades of the students in various science-related examinations may also be used as parameters in relation to the school's effectiveness aside from the six domains identified in the study. Also, the instrument can be used to different Philippine schools inside or outside of the country to measure the effectiveness of their implementation of the K to 12 Science Curriculum and reference for future plans.

4. The strategic plan developed in the study can be adapted and improved to provide specific actions that will target the challenges Philippine schools are facing that inhibit their effective implementation of the curriculum.

5. The leaders tasked to supervise and manage our Philippine schools overseas can extend and strengthen their effort in educating and training the teachers and administrators as regards the implementation of the K to 12 Science Curriculum. They should also conduct regular monitoring and evaluation visits to our Philippine schools overseas to intensively check the quality of education they are giving to the Filipino youth overseas. Similarly, they can conduct extensive research regarding the implementation of K to 12 Curriculum to Philippine schools overseas to identify areas

that can be improved. It should be borne in mind that there are birth pains that naturally come with every new beginnings. What is apparent and important is to know where that new beginning shall take us and how it can be reached.

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APPENDICES

Appendix A

REQUEST OF PERMISSION TO CONDUCT RESEARCH

Mr. Wilfredo C. Santos
Philippine Ambassador,
State of Qatar

Dear Mr. Santos,

Greetings!

I am in the process of writing my thesis entitled **"Assessment of the Effectiveness of the Implementation of K to 12 Science Curriculum of Philippine Schools in Qatar",** in line with the requirement in Master of Arts in Science Education at Philippine Normal University- Manila.

May I therefore humbly ask for your permissionto conduct this study to Philippine schools in Qatar; Philippine International School- Qatar (PISQ) and Philippine School Doha (PSD).

Endorsing the study and encouraging the participation will pave the way towards improving Philippine schools in Qatar.

Rest assured that any information be shared by the administrators, faculty, parents and students will be held confidential and be used solely for the purpose of the study.

Enclosed is a set of copies of the instrument to be used in the research study.

If you require any further information, please do not hesitate to contact me at +974 7757 6504 or my thesis adviser at +63 917 863 7171.

I will appreciate greatly your prompt and favorable consideration in this matter.

Respectfully yours,

Mary Glorace I. Jacob
Researcher

Signed by:

Antriman Z. Orleans, Ph.D.
Thesis Adviser

Noted by:

Teresita T. Rungduin, Ph.D.
Director, Graduate Research Office

PHILIPPINE EMBASSY
Doha, State of Qatar
(Ambassador's Office)
Date : 08 NOV 2015
Time : 12:45 pm
By :

RECEIVED
12 NOV 2015

Appendix B

REQUEST OF PERMISSION TO CONDUCT RESEARCH

EMBASSY OF THE REPUBLIC OF THE PHILIPPINES
سفارة جمهورية الفلبين
DOHA
LTR. DH- 731 - 2015

10 November 2015

Dear Mr. Iyas,

I wish to refer to your office the attached request of Ms. Mary Glorace I. Jacob to conduct a study on the **"Assessment of the Effectiveness of the Implementation of K to 12 Science Curriculum of Philippine Schools in Qatar"** at the Philippine School Doha.

Ms. Jacob is in the process of writing her thesis which is a requirement of her Master's degree in Science Education at the Philippine Normal University – Manila.

Enclosed, for reference, is a set of copies of the instrument to be used in the research study.

For any further information, please contact Ms. Jacob at mobile number +974 7757-6504 or her thesis adviser, Dr. Antriman V. Orleans at +63917-8637171.

PHILIPPINE EMBASSY DOHA

Very truly yours,

WILFREDO C. SANTOS
Ambassador

MR. JASON IYAS
School Principal
Philippine International School Qatar
Doha, State of Qatar

RECEIVED
12 NOV 2015

P.O.Box: 24900, Doha, State of Qatar
Tel:. 44831585, Fax.: 44831595
www.dohape.dfa.gov.ph

Appendix C

REQUEST OF PERMISSION TO CONDUCT RESEARCH

EMBASSY OF THE REPUBLIC OF THE PHILIPPINES
سفارة جمهورية الفلبين
DOHA

LTR. DH. 730. 2015

10 November 2015

Dear Dr. Acosta,

I wish to refer to your office the attached request of Ms. Mary Glorace I. Jacob to conduct a study on the **"Assessment of the Effectiveness of the Implementation of K to 12 Science Curriculum of Philippine Schools in Qatar"** at the Philippine School Doha.

Ms. Jacob is in the process of writing her thesis which is a requirement of her Master's degree in Science Education at the Philippine Normal University – Manila.

Enclosed, for reference, is a set of copies of the instrument to be used in the research study.

For any further information, please contact Ms. Jacob at mobile number +974 7757-6504 or her thesis adviser, Dr. Antriman V. Orleans at +63917-8637171.

PHILIPPINE EMBASSY DOHA

Very truly yours,

WILFREDO C. SANTOS
Ambassador

DR. ALEXANDER S. ACOSTA
School Principal
Philippine School Doha
Doha, State of Qatar

Pls Dr. Villanueva
Please facilitate

12-11-15

P.O.Box: 24900, Doha, State of Qatar
Tel:. 44831585, Fax.: 44831595
www.dohape.dfa.gov.ph

Appendix D

REQUEST OF PERMISSION TO CONDUCT RESEARCH

Coordinator, High School Department
Philippine School Doha

Dear Mrs. ,

Greetings!

I am in the process of writing my thesis entitled **"Assessment of the Effectiveness of the Implementation of K to 12 Science Curriculum of Philippine Schools in Qatar",** in line with the requirement in Master of Arts in Science Education at Philippine Normal University- Manila.

May I therefore humbly seek your generous assistance in terms of lending me a fraction of your precious time, that of your teachers, students and parents to input pertinent data by answering the questionnaire. Endorsing the study and encouraging the participation will pave the way towards improving Philippine schools in Qatar.

Rest assured that any information be shared by the administrators, teachers, parents and students will be held confidential and be used solely for the purpose of the study.

Enclosed is a set of copies of the instrument to be used in the research study.

I will appreciate greatly your prompt and favorable consideration in this matter.

Respectfully yours,

Mary Glorace I. Jacob
Researcher

Signed by:

Antriman A. Orleans, Ph.D.
Thesis Adviser

Approved by:

Coordinator, High School Department

11/15/15

Appendix E

LETTER TO THE EVALUATORS

Dear _____,

Greetings!

I am a graduate student taking up Master of Arts in Science Education with Specialization in Chemistry at Philippine Normal University- Manila. I am in the process of writing my thesis entitled **"Assessment of the Effectiveness of the Implementation of K to 12 Science Curriculum of Philippine Schools in Qatar".**

In line with this, I would like to ask for your consent to be one of the experts in the validation of the instrument for the study using the attached rating tool.

I fervently hope that this request would merit your approval.

Thank you!

Very truly yours,

Mary Glorace I. Jacob
Researcher

Signed by:

Antriman V. Orleans, Ph.D.
Thesis Adviser

Appendix F

LETTER TO THE RESPONDENTS

To whom it may concern:

Greetings!

I am a graduate student taking up Master of Arts in Science Education with Specialization in Chemistry at Philippine Normal University- Manila. I am in the process of writing my thesis entitled "**Assessment of the Effectiveness of the Implementation of K to 12 Science Curriculum of Philippine Schools in Qatar".**

In this connection, I would like to request your permission to accomplish the attached questionnaire.

Your cooperation will certainly contribute to the success of this study.

Rest assured that the information gathered will be held in strict confidence.

Thank you in anticipation of your favorable action on this request.

Respectfully yours,

Mary Glorace I. Jacob
Researcher

Appendix G

INFORMED CONSENT FORM

To whom it may concern,

Greetings!

I am a graduate student taking up Master of Arts in Science Education with Specialization in Chemistry at Philippine Normal University- Manila. I am in the process of writing my thesis entitled "**Assessment of the Effectiveness of the Implementation of K to 12 Science Curriculum of Philippine Schools in Qatar".**

In this connection, I would like to request your permission to allow you son/ daughter to participate in this study. The following describes the purpose and procedures of the study. Also described is your right to withdraw your son/ daughter from the study.

Explanation of Procedures
The main purpose of the study is to determine the effectiveness of the implementation of K12 Science curriculum of Philippine schools in Qatar in terms of physical facilities, instruction, content, support to students, library and instructional materials, and administration. I am conducting this to serve as feedback on the quality of secondary science education. Participation in the study involves completion of a questionnaire which will last for approximately 5- 15 minutes.

Risks and Discomforts
There are no risks or discomforts that are anticipated from your daughter's/ son's participation in the study.

Benefits
The findings could be bases for adopting new teaching strategies and approach that could be implemented to the school through the effort of the head of the school.

Confidentiality
Rest assured that the information gathered will be held in strict confidence. Only the researcher will have access to the study data and information.

Withdrawal without Prejudice
Participation in this study is voluntary; refusal to participate will involve no penalty. You are free to withdraw consent and discontinue participation.

Your cooperation will certainly contribute to the success of this study.

If you require any further information, please do not hesitate to contact me at _____ or my thesis adviser at _____.

Thank you in anticipation of your favorable action on this request.

Respectfully yours,
Mary Glorace I. Jacob

I, _____ (name; please print clearly), have read the above information. I freely agree for my daughter/ son to participate in this study. I understand that may son/ daughter is free to refuse to answer the questionnaire. I understand that his/ her responses will be kept anonymous.

_____ _____
Parent's/ Guardian's Signature Date

Appendix H

STUDENT SURVEY FORM

PART I: PERSONAL INFORMATION
Name of the Respondent (Optional): _____
Name of School: _____
Gender:
□ Male
□ Female
Age: ___
Grade Level: _____
Number of years studying in the present school: _____

PART II: RESPONDENT'S PERCEPTION
Please read the following statements carefully. Select the response that best describes your judgement or opinion by ticking (√) in the space provided. Feel free, if you desire, to write comments in the margin to further explain your choices.

A. PHYSICAL FACILITIES

A. CLASSROOMS	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
1. Classroom size is adequate.						
2. The classrooms are well lighted, ventilated and acoustically conditioned.						
3. The classrooms are provided with enough furniture (tables and chairs) and equipment (TV, projector, speaker, etc.).						
4. The cleanliness and orderliness of the classrooms are maintained.						
B. SCIENCE LABORATORIES	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
1. The layout of the science laboratory conform to the particular needs of the students.						
2. The laboratory is properly lighted and well ventilated.						
3. The laboratory has at least two exit doors that open outward.						

4. Furniture/ equipment arrangement allows free flow of movement and enables students to work comfortably without interference.						
5. Usable fire extinguishers, first aid kit, and other emergency materials are accessible to teachers and students.						
6. Gas, water and electricity are utilized for Science experiments and activities.						
7. The demonstration table equipped with sink, water, electrical and gas outlets, is available and utilized.						
8. The laboratory is neat, clean and orderly.						
C. EQUIPMENT, MATERIALS AND SUPPLIES	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
1. The equipment, instruments, and materials needed in the laboratory are available and sufficient.						
2. Apparatuses, tools and materials conform to the specifications required for the subject.						
3. Laboratory supplies and equipment are properly labeled and are well- kept in separate stock rooms.						
4. The laboratory equipment/ instruments are in good condition and are periodically calibrated.						
5. Waste disposal of chemicals is efficiently and effectively managed.						

B. INSTRUCTION

A. TEACHING METHOD AND TECHNIQUES	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
1. Classroom instruction is enriched through the use of the following tools/ strategies: a. Textbook						
b. Calculator						
c. Model/ Dummy						

d. Group Work/ Pair Work							
e. Experiments							
f. Problem- Solving							
g. Interactive Learning							
h. Film- Showing/ Video							
i. Reporting							
2. The teacher improves the quality of Science instruction by: a. Working with other teachers							
b. Working with other individual students							
c. Communicating with parents							
3. The science teacher… a. has an extensive knowledge of basic science concepts and their applications to daily life and with other disciplines.							
b. updates himself or herself on recent developments in scientific research to motivate learners and make science teaching interesting.							
c. understands the unique characteristics of learners, their strengths and potential, talents, abilities and perspectives.							
d. knows a wide range of ways in which learners are likely to learn science best.							
e. clarifies and develops students' understanding of scientific concepts under investigation.							
f. knows laboratory equipment, tools, and other instructional materials to be able to work with students with varying learning needs.							
g. allows students to ask questions, discuss possible answers to the questions, and make decisions.							

h. practices safe and proper laboratory techniques for the preparation, storage, dispensing, supervision, and disposal of all science materials used in teaching and learning.						
i. encourages students to read newspaper articles about science, to follow TV programs on new advances in science.						
B. ASSESSMENT OF ACADEMIC PERFORMANCE	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
1. Explains and gives copy of system of evaluation and grading to the students.						
2. Has a system of evaluating the student performance through a combination of the following: a. Formative tests such as quizzes, unit test;						
b. Summative tests such as mid-quarterly and quarterly examination						
c. Projects						
d. Performance tests/ practical tests						
e. Reflection/ reaction papers						
3. Assists students with academic deficiencies and other problems which may affect their grades.						
4. Gives recognition for exemplary academic and non- academic performances.						
5. Returns and discusses answers or results of the tests.						

C. SUPPORT TO STUDENTS

A. STUDENT PROGRAMS AND SERVICES	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**

1. The school provides the following for enhancement and deepening of science skills: a. Science activities (quiz bee, research, exhibit, etc.)						
b. Science organizations						
c. Science trainings						
d. Educational tours/ learning visits/ other co- curricular activities						
e. Symposia, seminars, workshops, professional lectures						
2. The school encourages involvement of the students in the following: a. Regional/ district/ international science competitions						
b. Regional/ district/ international science organizations/ campaigns						
3. The school informs the students, parents and other stakeholders on science programs and services.						
4. There is adequate funding for the conduct of science activities and programs.						
B. STUDENT DEVELOPMENT	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
1. The school provides adequate staff, physical facilities, equipment and materials for various student science activities.						
2. There are clear policies and procedures of student recruitment, selection, and admission in various science activities/ program/ organization/ competition.						
3. The school provides opportunities for promotion and appreciation of science.						
4. Science development programs are regularly conducted.						

D. LIBRARY AND INSTRUCTIONAL MATERIALS

A. COLLECTION DEVELOPMENT, ORGANIZATION AND PRESERVATION	Excellently Attained	Highly Attained	Attained	Slightly Attained	Not Attained	Not Applicable
1. The quality and quantity of science books and materials conform with the needs of the students and teachers.						
2. The library collection is organized.						
3. There are available non- print, digital and electronic science resources.						
4. The library maintain a relevant and updated collection.						
B. SERVICES AND UTILIZATION	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
1. The library provides the following: a. On- Line Public Access (OPAC)						
b. Inventory reporting						
c. Internet searching						
d. Photocopying						
2. The librarians and staff are available during library hours to assist and provide library services.						
C. PHYSICAL SET- UP AND FACILITIES	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
1. The library is strategically located and accessible to students, faculty and other clientele.						
2. The size of the library meets standard requirements considering the present enrollment and future expansion.						
3. The reading room can accommodate at least 10% of the school enrollment at any given time.						
4. The library is well lighted.						

5. The library is well ventilated.						
6. The atmosphere is conducive to learning.						

- What are the problems you encountered in implementing the K to 12 Science Curriculum in the following areas:

a. Physical facilities;

_____
_____
_____
_____

b. Instruction;

_____
_____
_____
_____

c. Content;

_____
_____
_____

d. Support to students;

_____
_____
_____
_____

e. Library and instructional materials;

_____
_____
_____

f. Administration

_____
_____
_____
_____

Appendix I

ADMINISTRATOR/ FACULTY SURVEY FORM

PART I: PERSONAL INFORMATION

Name of the Respondent (Optional): _____

Name of School: _____

Gender:

□ Male □ Female

Age:

□ 21-25 □ 36-45 □ 56-60

□ 26-35 □ 46-55 □ 61-65

Civil Status:

□ Single □ Married

□ Widow/er □ Separated

Membership in Science Organization: (Specify) _____

PART II: RESPONDENT'S PERCEPTION

Please read the following statements carefully. Select the response that best describes your judgement or opinion by ticking (√) in the space provided. Feel free, if you desire, to write comments in the margin to further explain your choices.

A. PHYSICAL FACILITIES

A. CLASSROOMS	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
Classroom size is adequate and meets standard specifications (1.5 sq.m. per student) for instruction.						
The classrooms are well lighted, ventilated and acoustically conditioned.						
The classrooms are provided with enough furniture (tables and chairs) and equipment (TV, projector, speaker, etc.).						
The cleanliness and orderliness of the classrooms are maintained.						
B. SCIENCE LABORATORIES	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
The layout of the science laboratory conform with acceptable standards (Building Code of Qatar/ Code of Sanitation of Qatar) and to the particular needs of the students.						
The laboratory is properly lighted and well ventilated.						

The laboratory has at least two exit doors that open outward.						
Furniture/ equipment arrangement allows free flow of movement and enables students to work comfortably without interference.						
Safety and precautionary measures are implemented.						
Usable fire extinguishers, first aid kit, and other emergency materials are accessible to teachers and students.						
Laboratory operation manuals for the faculty and students are provided.						
Gas, water and electricity are utilized for Science experiments and activities.						
The demonstration table equipped with sink, water, electrical and gas outlets, is available and utilized.						
The laboratory is neat, clean and orderly.						
C. EQUIPMENT, MATERIALS AND SUPPLIES	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
The equipment, instruments, and materials needed in the laboratory are available and sufficient.						
Apparatuses, tools and materials conform to the specifications required for the subject.						
A trained laboratory technician/ assistant is available for the proper upkeep of the laboratory.						
Laboratory supplies and equipment are properly labeled and are well- kept in separate stock rooms.						
Laboratory materials and supplies are regularly replenished/ replaced whenever applicable.						
The inventory of laboratory facilities and equipment is systematically and periodically conducted.						
The laboratory equipment/ instruments are in good condition and are periodically calibrated.						
Waste disposal of chemicals is efficiently and effectively managed.						

B. INSTRUCTION

A. TEACHING METHOD AND TECHNIQUES	Excellently Attained	Highly Attained	Attained	Slightly Attained	Not Attained	Not Applicable
Classroom instruction is enriched through the use of the following tools/ strategies: Textbook						
Calculator						
Model/ Dummy						
Group Work/ Pair Work						
Experiments						
Problem- Solving						
Interactive Learning						
Film- Showing/ Video						
Reporting						
The teacher improves the quality of Science instruction by: Working with other teachers						
Working with other individual students						
Communicating with parents						
The science teacher… has an extensive knowledge of basic science concepts and their applications to daily life and with other disciplines.						
has mastery of concepts considered important for all students.						
can identify and address science misconceptions of students and in textbooks.						
updates himself or herself on recent developments in scientific research to motivate learners and make science teaching interesting.						
understands the unique characteristics of learners, their strengths and potential, talents, abilities and perspectives.						

knows how to plan and design strategies to support the intellectual, social, and personal development of each student.						
knows how to develop learners' deeper understanding of subject matter.						
knows a wide range of ways in which learners are likely to learn science best.						
clarifies and develops students' understanding of scientific concepts under investigation.						
knows laboratory equipment, tools, another instructional materials to be able to work with students with varying learning needs.						
allows students to ask questions, discuss possible answers to the questions, and make decisions.						
practices safe and proper laboratory techniques for the preparation, storage, dispensing, supervision, and disposal of all science materials used in teaching and learning.						
provides learners with opportunities to identify relevant science topics and issues (including personal and social issues).						
encourages students to read newspaper articles about science, to follow TV programs on new advances in science.						
B. ASSESSMENT OF ACADEMIC PERFORMANCE	**Excellentty Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
Explains and gives copy of system of evaluation and grading to the students.						
Has a system of evaluating the student performance through a combination of the following: Formative tests such as quizzes, unit test;						
Summative tests such as mid- quarterly and quarterly examination						
Projects						
Performance tests/ practical tests						
Reflection/ reaction papers						

Assists students with academic deficiencies and other problems which may affect their grades.						
Gives recognition for exemplary academic and non-academic performances.						
Returns and discusses answers or results of the tests.						

C. CONTENT

CONTENT	Excellently Attained	Highly Attained	Attained	Slightly Attained	Not Attained	Not Applicable
Meets the needs and provides opportunities for students in the advancement of science learning.						
Encourages students to develop their innate talents and skills to become productive citizens.						
Provides opportunity in developing decision- making ability to become life- long learners.						
Provides activities for scientific and creative thinking skills.						
Develops or enhances self- confidence through group dynamics in science learning.						
Provides opportunity to be globally aware and competitive.						

D. SUPPORT TO STUDENTS

A. STUDENT PROGRAMS AND SERVICES	Excellently Attained	Highly Attained	Attained	Slightly Attained	Not Attained	Not Applicable
The school provides the following for enhancement and deepening of science skills: Science activities (quiz bee, research, exhibit, etc.)						
Science organizations						
Science trainings						
Educational tours/ learning visits/ other co- curricular activities						

Symposia, seminars, workshops, professional lectures						
The school encourages involvement of the students in the following: Regional/ district/ international science competitions						
Regional/ district/ international science organizations/ campaigns						
The school informs the students, parents and other stakeholders on science programs and services.						
There is adequate funding for the conduct of science activities and programs.						
B. STUDENT DEVELOPMENT	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
The school provides adequate staff, physical facilities, equipment and materials for various student science activities.						
There are clear policies and procedures of student recruitment, selection, and admission in various science activities/ program/ organization/ competition.						
The school provides opportunities for promotion and appreciation of science.						
Science development programs are regularly conducted.						

E. LIBRARY AND INSTRUCTIONAL MATERIALS

A. COLLECTION DEVELOPMENT, ORGANIZATION AND PRESERVATION	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
The quality and quantity of science books and materials conform with the needs of the students and teachers.						
The library collection is organized.						
There are available non- print, digital and electronic science resources.						

The library maintain a relevant and updated collection.						
B. SERVICES AND UTILIZATION	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
The library provides the following: On- Line Public Access (OPAC)						
Inventory reporting						
Internet searching						
Photocopying						
The librarians and staff are available during library hours to assist and provide library services.						
C. PHYSICAL SET- UP AND FACILITIES	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
The library is strategically located and accessible to students, faculty and other clientele.						
The size of the library meets standard requirements considering the present enrollment and future expansion.						
The reading room can accommodate at least 10% of the school enrollment at any given time.						
The library is well lighted.						
The library is well ventilated.						
The atmosphere is conducive to learning.						

F. ADMINISTRATION

A. ACADEMIC ADMINISTRATION	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
The administrators have appropriate/ relevant educational qualification and experience.						
The administrators implement a supervisory program.						
The administrators and the faculty work together for the improvement of the Science area, particularly in: Setting standards and targets						

Planning of programs and other related activities						
Implementing, monitoring and evaluation of plans, programs and other related activities						
Providing opportunities for professional growth and development for the Faculty						
Preparing guidelines on the proper use and maintenance of facilities, apparatuses, tools and materials, etc.						
B. STUDENT ADMINISTRATION	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
Students are provided opportunities to participate in the planning and implementation of science activities.						
Concerned officials, faculty and staff act promptly on request, needs and problems of the students.						
The administration, faculty, staff and students work harmoniously and maintain good relationship.						
C. FINANCIAL MANAGEMENT	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
The school allocates funds for the following Science related activities and services: Improvement of laboratory						
Repair and maintenance of facilities and equipment						
Purchase of new equipment, supplies and materials						
Participation in competitions and campaigns						
Partnership with organization/ club						

The administrative officials, staff, faculty and student representatives participate in the budget preparation and procurement of science apparatuses, tools and materials.						
D. FACULTY ADMINISTRATION	**Excellently Attained**	**Highly Attained**	**Attained**	**Slightly Attained**	**Not Attained**	**Not Applicable**
Regular classroom observation/ supervision						
Regular faculty performance evaluation						
Attendance/ participation of faculty in science related trainings and seminars						
Encouragement of faculty members to produce their own instructional materials such as modules, visual aids, manuals and textbooks.						

- What are the problems/ challenges you encountered in implementing the K to 12 Science Curriculum in the following areas:

a. Physical facilities;
_____
_____
_____
_____

b. Instruction;
_____
_____

c. Content;
_____
_____
_____
_____

d. Support to students;
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_____
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e. Library and instructional materials;
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f. Administration
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Appendix J

FREQUENCY DISTRIBUTION OF PISQ STUDENT- RESPONSES

Table J1

According to Domain A: Physical Facilities

Physical Facilities	Excellently Attained (4)		Highly Attained (3)		Attained (2)		Slightly Attained (1)		Not Attained (0)		Not Applicable (N/A)		Mean	
A. CLASSROOMS	f	%	f	%	f	%	f	%	f	%	f	%	Value	Rank
1. Classroom size is adequate.	45	16.20	53	19.10	93	33.60	67	24.20	14	5.10	5	1.80	2.23	10
2. The classrooms are well lighted, ventilated and acoustically conditioned.	44	15.90	91	32.90	92	33.20	44	15.90	5	1.80	1	0.40	2.46	4
3. The classrooms are provided with enough furniture (tables and chairs) and equipment (TV, projector, speaker, etc.).	23	8.30	61	22.00	86	31.00	83	30.00	20	7.20	4	1.40	1.99	15
4. The cleanliness and orderliness of the classrooms are maintained.	24	8.70	61	22.00	104	37.50	67	24.20	15	5.40	6	2.20	2.11	13
B. SCIENCE LABORATORIES														
1. The layout of the science laboratory conform to the particular needs of the students.	32	11.60	84	30.30	97	35.00	53	19.10	9	3.20	2	0.70	2.30	7
2. The laboratory is properly lighted and well ventilated.	57	20.60	103	37.20	76	27.40	34	12.30	5	1.80	2	0.70	2.65	2
3. The laboratory has at least two exit doors that open outward.	17	6.10	30	10.80	48	17.30	50	18.10	84	30.30	48	17.30	1.96	17
4. Furniture/ equipment arrangement allows free flow of movement and enables students to work comfortably without interference.	32	11.60	63	22.70	88	31.80	74	26.70	16	5.80	4	1.40	2.12	12
5. Usable fire extinguishers, first aid kit, and other emergency materials are accessible to teachers and students.	45	16.20	53	19.10	79	28.50	58	20.90	30	10.80	12	4.30	2.22	11
6. Gas, water and electricity are utilized for Science experiments and activities.	28	10.10	52	18.80	83	30.00	69	24.90	32	11.60	13	4.70	2.05	14

7. The demonstration table equipped with sink, water, electrical and gas outlets, is available and utilized.	22	7.90	44	15.90	70	25.30	63	22.70	53	19.10	25	9.00	1.98	16
8. The laboratory is neat, clean and orderly.	81	29.20	74	26.70	73	26.40	45	16.20	2	0.70	2	0.70	2.70	1
C. EQUIPMENT, MATERIALS AND SUPPLIES														
1. The equipment, instruments, and materials needed in the laboratory are available and sufficient.	32	11.60	69	24.90	109	39.40	54	19.50	10	3.60	3	1.10	2.25	9
2. Apparatuses, tools and materials conform to the specifications required for the subject.	44	15.90	66	23.80	103	37.20	51	18.40	10	3.60	3	1.10	2.33	6
3. Laboratory supplies and equipment are properly labeled and are well- kept in separate stock rooms.	54	19.50	63	22.70	88	31.80	59	21.30	11	4.00	2	0.70	2.35	5
4. The laboratory equipment/ instruments are in good condition and are periodically calibrated.	56	20.20	81	29.20	83	30.00	46	16.60	6	2.20	5	1.80	2.54	3
5. Waste disposal of chemicals is efficiently and effectively managed.	43	15.50	60	21.70	88	31.80	55	19.90	21	7.60	10	3.60	2.29	8
OVERALL													2.27	

Table J2

According to Domain B: Instruction

Instruction	**Excellently Attained (4)**		**Highly Attained (3)**		**Attained (2)**		**Slightly Attained (1)**		**Not Attained (0)**		**Not Applicable (N/A)**		**Mean**	
A. TEACHING METHOD AND TECHNIQUES	**F**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**Value**	**Rank**
1. Classroom instruction is enriched through the use of the following tools/ strategies:														
a. Textbook	133	48.01	84	30.32	39	14.08	18	6.50	2	.72	1	0.36	3.19	4.5
b. Calculator	94	33.94	87	31.41	59	21.30	32	11.55	3	1.08	2	0.72	2.88	18
c. Model/ Dummy	41	14.80	34	12.27	54	19.49	64	23.10	47	16.97	37	13.36	2.25	29
d. Group Work/ Pair Work	106	38.27	88	31.77	56	20.22	16	5.78	10	3.61	1	0.36	2.96	15.5
e. Experiments	59	21.30	76	27.44	70	25.27	49	17.69	14	5.05	9	3.25	2.52	25
f. Problem- Solving	111	40.07	90	32.49	57	20.58	13	4.69	2	.72	4	1.44	3.11	11
g. Interactive Learning	88	31.77	97	35.02	55	19.86	32	11.55	3	1.08	2	0.72	2.87	19

h. Film- Showing/ Video	75	27.08	94	33.94	67	24.19	27	9.75	11	3.97	3	1.08	2.74	21
i. Reporting	105	37.91	95	34.30	54	19.49	19	6.86	2	.72	2	0.72	3.04	12
2. The teacher improves the quality of Science instruction by:														
a. Working with other teachers	51	18.41	62	22.38	82	29.60	55	19.86	21	7.58	6	2.17	2.31	28
b. Working with other individual students	77	27.80	74	26.71	80	28.88	36	13.00	9	3.25	1	0.36	2.64	24
c. Communicating with parents	38	13.72	61	22.02	80	28.88	59	21.30	30	10.83	9	3.25	2.16	30
3. The science teacher…														
a. has an extensive knowledge of basic science concepts and their applications to daily life and with other disciplines.	142	51.26	74	26.71	49	17.69	11	3.97	1	.36	0	0.00	3.25	2
b. updates himself or herself on recent developments in scientific research to motivate learners and make science teaching interesting.	123	44.40	82	29.60	55	19.86	14	5.05	2	.72	1	0.36	3.13	9
c. understands the unique characteristics of learners, their strengths and potential, talents, abilities and perspectives.	103	37.18	90	32.49	59	21.30	18	6.50	6	2.17	1	0.36	2.97	14
d. knows a wide range of ways in which learners are likely to learn science best.	106	38.27	79	28.52	67	24.19	21	7.58	3	1.08	1	0.36	2.96	15.5
e. clarifies and develops students' understanding of scientific concepts under investigation.	106	38.27	79	28.52	58	20.94	29	10.47	4	1.44	1	0.36	2.93	17
f. knows laboratory equipment, tools, and other instructional materials to be able to work with students with varying learning needs.	133	48.01	71	25.63	60	21.66	9	3.25	2	.72	2	0.72	3.19	4.5
g. allows students to ask questions, discuss possible answers to the questions, and make decisions.	151	54.51	68	24.55	43	15.52	12	4.33	3	1.08	0	0.00	3.27	1
h. practices safe and proper laboratory techniques for the preparation, storage, dispensing, supervision, and disposal of all science materials used in teaching and learning.	122	44.04	80	28.88	50	18.05	20	7.22	2	.72	3	1.08	3.12	10
i. encourages students to read newspaper articles about science, to follow TV programs on new advances in science.	59	21.30	57	20.58	83	29.96	58	20.94	15	5.42	5	1.81	2.37	27
B. ASSESSMENT OF ACADEMIC PERFORMANCE														

1. Explains and gives copy of system of evaluation and grading to the students.	71	25.63	90	32.49	85	30.69	22	7.94	9	3.25	0	0.00	2.69	23
2. Has a system of evaluating the student performance through a combination of the following:														
a. Formative tests such as quizzes, unit test;	113	40.79	101	36.46	53	19.13	8	2.89	2	.72	0	0.00	3.14	8
b. Summative tests such as mid- quarterly and quarterly examination	124	44.77	106	38.27	30	10.83	15	5.42	2	.72	0	0.00	3.21	3
c. Projects	118	42.60	97	35.02	50	18.05	10	3.61	2	.72	0	0.00	3.15	6.5
d. Performance tests/ practical tests	123	44.40	91	32.85	44	15.88	14	5.05	4	1.44	1	0.36	3.15	6.5
e. Reflection/ reaction papers	61	22.02	75	27.08	73	26.35	46	16.61	19	6.86	3	1.08	2.44	26
3. Assists students with academic deficiencies and other problems which may affect their grades.	84	30.32	96	34.66	62	22.38	26	9.39	8	2.89	1	0.36	2.81	20
4. Gives recognition for exemplary academic and non- academic performances.	70	25.27	90	32.49	88	31.77	18	6.50	10	3.61	1	0.36	2.70	22
5. Returns and discusses answers or results of the tests.	114	41.16	82	29.60	58	20.94	18	6.50	5	1.81	0	0.00	3.02	13
OVERALL													2.87	

Table J3

According to Domain C: Support to Students

Support to Students	**Excellently Attained (4)**		**Highly Attained (3)**		**Attained (2)**		**Slightly Attained (1)**		**Not Attained (0)**		**Not Applicable (N/A)**		**Mean**	
A. STUDENT PROGRAMS AND SERVICES	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**Value**	**Rank**
1. The school provides the following for enhancement and deepening of science skills:														
a. Science activities (quiz bee, research, exhibit, etc.)	108	38.99	94	33.94	50	18.05	21	7.58	4	1.44	0	0.00	3.01	1
b. Science organizations	60	21.66	75	27.08	81	29.24	42	15.16	17	6.14	2	0.72	2.45	4
c. Science trainings	20	7.22	63	22.74	80	28.88	75	27.08	33	11.91	6	2.17	1.93	11
d. Educational tours/ learning visits/ other co-curricular activities	23	8.30	45	16.25	72	25.99	71	25.63	50	18.05	16	5.78	1.88	12

e. Symposia, seminars, workshops, professional lectures	15	5.42	48	17.33	71	25.63	81	29.24	46	16.61	16	5.78	1.83	13
2. The school encourages involvement of the students in the following:														
a. Regional/ district/ international science competitions	36	13.00	50	18.05	113	40.79	48	17.33	24	8.66	6	2.17	2.16	8
b. Regional/ district/ international science organizations/ campaigns	34	12.27	53	19.13	94	33.94	57	20.58	31	11.19	8	2.89	2.09	10
3. The school informs the students, parents and other stakeholders on science programs and services.	40	14.44	76	27.44	82	29.60	50	18.05	23	8.30	6	2.17	2.28	6
4. There is adequate funding for the conduct of science activities and programs.	32	11.55	69	24.91	88	31.77	58	20.94	25	9.03	5	1.81	2.14	9
B. STUDENT DEVELOPMENT														
1. The school provides adequate staff, physical facilities, equipment and materials for various student science activities.	56	20.22	82	29.60	95	34.30	36	13.00	6	2.17	2	0.72	2.55	2
2. There are clear policies and procedures of student recruitment, selection, and admission in various science activities/ program/ organization/ competition.	45	16.25	92	33.21	93	33.57	39	14.08	7	2.53	1	0.36	2.48	3
3. The school provides opportunities for promotion and appreciation of science.	45	16.25	73	26.35	100	36.10	44	15.88	14	5.05	1	0.36	2.34	5
4. Science development programs are regularly conducted.	40	14.44	68	24.55	96	34.66	52	18.77	17	6.14	4	1.44	2.27	7
OVERALL													2.26	

Table J4

According to Domain D: Library and Instructional Materials

Library and Instructional Materials	**Excellently Attained (4)**		**Highly Attained (3)**		**Attained (2)**		**Slightly Attained (1)**		**Not Attained (0)**		**Not Applicable (N/A)**		**Mean**	
A. COLLECTION DEVELOPMENT, ORGANIZATION AND PRESERVATION	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**Value**	**Rank**

1. The quality and quantity of science books and materials conform with the needs of the students and teachers.	78	28.16	92	33.21	79	28.52	25	9.03	1	.36	2	0.72	2.82	2.5
2. The library collection is organized.	105	37.91	79	28.52	68	24.55	18	6.50	6	2.17	1	0.36	2.95	1
3. There are available non-print, digital and electronic science resources.	43	15.52	67	24.19	90	32.49	44	15.88	25	9.03	8	2.89	2.30	10
4. The library maintain a relevant and updated collection.	52	18.77	62	22.38	88	31.77	50	18.05	17	6.14	8	2.89	2.38	9
B. SERVICES AND UTILIZATION														
1. The library provides the following:														
a. On- Line Public Access (OPAC)	24	8.66	53	19.13	69	24.91	64	23.10	44	15.88	23	8.30	2.06	13
b. Inventory reporting	23	8.30	51	18.41	97	35.02	52	18.77	43	15.52	11	3.97	1.97	15
c. Internet searching	30	10.83	45	16.25	72	25.99	54	19.49	55	19.86	21	7.58	2.01	14
d. Photocopying	37	13.36	42	15.16	73	26.35	54	19.49	51	18.41	20	7.22	2.07	12
2. The librarians and staff are available during library hours to assist and provide library services.	54	19.49	79	28.52	80	28.88	39	14.08	14	5.05	11	3.97	2.55	7
C. PHYSICAL SET- UP AND FACILITIES														
1. The library is strategically located and accessible to students, faculty and other clientele.	71	25.63	80	28.88	91	32.85	27	9.75	6	2.17	2	0.72	2.68	6
2. The size of the library meets standard requirements considering the present enrollment and future expansion.	51	18.41	72	25.99	95	34.30	38	13.72	17	6.14	4	1.44	2.41	8
3. The reading room can accommodate at least 10% of the school enrollment at any given time.	37	13.36	52	18.77	91	32.85	68	24.55	22	7.94	7	2.53	2.13	11
4. The library is well lighted.	90	32.49	68	24.55	81	29.24	26	9.39	11	3.97	1	0.36	2.73	5
5. The library is well ventilated.	95	34.30	71	25.63	75	27.08	27	9.75	7	2.53	2	0.72	2.82	2.5
6. The atmosphere is conducive to learning.	90	32.49	68	24.55	84	30.32	23	8.30	10	3.61	2	0.72	2.76	4
OVERALL													2.44	

Appendix K

FREQUENCY DISTRIBUTION OF PSD STUDENT- RESPONSES

Table K1

According to Domain A: Physical Facilities

Physical Facilities	Excellently Attained (4)		Highly Attained (3)		Attained (2)		Slightly Attained (1)		Not Attained (0)		Not Applicable (N/A)		Mean	
A. CLASSROOMS	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**Value**	**Rank**
1. Classroom size is adequate.	35	12.46	78	27.76	116	41.28	34	12.10	16	5.69	2	0.71	2.31	16
2. The classrooms are well lighted, ventilated and acoustically conditioned.	50	17.79	89	31.67	74	26.33	55	19.57	12	4.27	1	0.36	2.40	15
3. The classrooms are provided with enough furniture (tables and chairs) and equipment (TV, projector, speaker, etc.).	79	28.11	90	32.03	60	21.35	40	14.23	11	3.91	1	0.36	2.67	14
4. The cleanliness and orderliness of the classrooms are maintained.	37	13.17	64	22.78	91	32.38	74	26.33	10	3.56	5	1.78	2.21	17
B. SCIENCE LABORATORIES														
1. The layout of the science laboratory conform to the particular needs of the students.	87	30.96	95	33.81	64	22.78	32	11.39	3	1.07	0	0.00	2.82	12
2. The laboratory is properly lighted and well ventilated.	109	38.79	93	33.10	55	19.57	19	6.76	4	1.42	1	0.36	3.02	7
3. The laboratory has at least two exit doors that open outward.	150	53.38	59	21.00	33	11.74	16	5.69	17	6.05	6	2.14	3.16	3
4. Furniture/ equipment arrangement allows free flow of movement and enables students to work comfortably without interference.	81	28.83	92	32.74	60	21.35	39	13.88	7	2.49	2	0.71	2.74	13
5. Usable fire extinguishers, first aid kit, and other emergency materials are accessible to teachers and students.	130	46.26	93	33.10	45	16.01	11	3.91	1	0.36	1	0.36	3.22	2
6. Gas, water and electricity are utilized for Science experiments and activities.	98	34.88	83	29.54	63	22.42	29	10.32	8	2.85	0	0.00	2.83	11

7. The demonstration table equipped with sink, water, electrical and gas outlets, is available and utilized.	109	38.79	89	31.67	56	19.93	20	7.12	7	2.49	0	0.00	2.97	9
8. The laboratory is neat, clean and orderly.	165	58.72	75	26.69	37	13.17	3	1.07	1	0.36	0	0.00	3.42	1
C. EQUIPMENT, MATERIALS AND SUPPLIES														
1. The equipment, instruments, and materials needed in the laboratory are available and sufficient.	69	24.56	125	44.48	64	22.78	17	6.05	5	1.78	1	0.36	2.85	10
2. Apparatuses, tools and materials conform to the specifications required for the subject.	93	33.10	102	36.30	71	25.27	13	4.63	1	0.36	1	0.36	2.98	8
3. Laboratory supplies and equipment are properly labeled and are well- kept in separate stock rooms.	127	45.20	86	30.60	48	17.08	18	6.41	2	0.71	0	0.00	3.13	4
4. The laboratory equipment/ instruments are in good condition and are periodically calibrated.	113	40.21	103	36.65	51	18.15	14	4.98	0	0.00	0	0.00	3.12	5
5. Waste disposal of chemicals is efficiently and effectively managed.	130	46.26	70	24.91	61	21.71	15	5.34	4	1.42	1	0.36	3.10	6
OVERALL													2.88	

Table K2

According to Domain B: Instruction

Instruction	**Excellently Attained (4)**		**Highly Attained (3)**		**Attained (2)**		**Slightly Attained (1)**		**Not Attained (0)**		**Not Applicable (N/A)**		**Mean**	
A. TEACHING METHOD AND TECHNIQUES	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**Value**	**Rank**
1. Classroom instruction is enriched through the use of the following tools/ strategies:														
a. Textbook	110	39.10	59	21.00	62	22.10	42	14.90	7	2.50	1	0.40	2.80	17
b. Calculator	72	25.60	95	33.80	77	27.40	30	10.70	6	2.10	1	0.40	2.71	21
c. Model/ Dummy	26	9.30	51	18.10	50	17.80	81	28.80	43	15.30	30	10.70	2.09	29
d. Group Work/ Pair Work	122	43.40	102	36.30	36	12.80	15	5.30	5	1.80	1	0.40	3.15	10.5
e. Experiments	61	21.70	71	25.30	80	28.50	54	19.20	13	4.60	2	0.70	2.42	26
f. Problem- Solving	131	46.60	92	32.70	46	16.40	9	3.20	1	0.40	2	0.70	3.24	6
g. Interactive Learning	96	34.20	92	32.70	61	21.70	28	10.00	4	1.40	0	0.00	2.88	16
h. Film- Showing/ Video	81	28.80	101	35.90	60	21.40	30	10.70	9	3.20	0	0.00	2.77	19.5
i. Reporting	75	26.70	90	32.00	91	32.40	21	7.50	2	0.70	2	0.70	2.79	18

2. The teacher improves the quality of Science instruction by:														
a. Working with other teachers	45	16.00	58	20.60	88	31.30	59	21.00	21	7.50	10	3.60	2.27	28
b. Working with other individual students	53	18.90	84	29.90	84	29.90	48	17.10	8	2.80	4	1.40	2.49	24
c. Communicating with parents	28	10.00	57	20.30	73	26.00	81	28.80	29	10.30	13	4.60	2.05	30
3. The science teacher…														
a. has an extensive knowledge of basic science concepts and their applications to daily life and with other disciplines.	147	52.30	76	27.00	43	15.30	9	3.20	5	1.80	1	0.40	3.26	5
b. updates himself or herself on recent developments in scientific research to motivate learners and make science teaching interesting.	113	40.20	102	36.30	51	18.10	12	4.30	2	0.70	1	0.40	3.12	12
c. understands the unique characteristics of learners, their strengths and potential, talents, abilities and perspectives.	95	33.80	89	31.70	72	25.60	21	7.50	4	1.40	0	0.00	2.89	15
d. knows a wide range of ways in which learners are likely to learn science best.	106	37.70	84	29.90	68	24.20	21	7.50	2	0.70	0	0.00	2.96	13.5
e. clarifies and develops students' understanding of scientific concepts under investigation.	91	32.40	106	37.70	61	21.70	19	6.80	2	0.70	2	0.70	2.96	13.5
f. knows laboratory equipment, tools, and other instructional materials to be able to work with students with varying learning needs.	157	55.90	69	24.60	44	15.70	9	3.20	2	0.70	0	0.00	3.32	2
g. allows students to ask questions, discuss possible answers to the questions, and make decisions.	144	51.20	79	28.10	37	13.20	17	6.00	3	1.10	1	0.40	3.23	7
h. practices safe and proper laboratory techniques for the preparation, storage, dispensing, supervision, and disposal of all science materials used in teaching and learning.	144	51.20	86	30.60	35	12.50	15	5.30	1	0.40	0	0.00	3.27	3.5
i. encourages students to read newspaper articles about science, to follow TV programs on new advances in science.	61	21.70	65	23.10	81	28.80	47	16.70	19	6.80	8	2.80	2.45	25
B. ASSESSMENT OF ACADEMIC PERFORMANCE														
1. Explains and gives copy of system of evaluation and grading to the students.	73	26.00	94	33.50	78	27.80	23	8.20	8	2.80	5	1.80	2.77	19.5

2. Has a system of evaluating the student performance through a combination of the following:														
a. Formative tests such as quizzes, unit test;	135	48.00	95	33.80	44	15.70	7	2.50	0	0.00	0	0.00	3.27	3.5
b. Summative tests such as mid- quarterly and quarterly examination	132	47.00	87	31.00	47	16.70	10	3.60	4	1.40	1	0.40	3.20	8
c. Projects	161	57.30	82	29.20	31	11.00	5	1.80	0	0.00	2	0.70	3.44	1
d. Performance tests/ practical tests	131	46.60	86	30.60	52	18.50	8	2.80	4	1.40	0	0.00	3.18	9
e. Reflection/ reaction papers	56	19.90	65	23.10	81	28.80	47	16.70	24	8.50	8	2.80	2.38	27
3. Assists students with academic deficiencies and other problems which may affect their grades.	56	19.90	96	34.20	88	31.30	35	12.50	2	0.70	4	1.40	2.64	22
4. Gives recognition for exemplary academic and non-academic performances.	59	21.00	90	32.00	95	33.80	29	10.30	6	2.10	2	0.70	2.62	23
5. Returns and discusses answers or results of the tests.	135	48.00	70	24.90	57	20.30	16	5.70	2	0.70	1	0.40	3.15	10.5
OVERALL													2.86	

Table K3

According to Domain C: Support to Students

Support to Students	**Excellently Attained (4)**		**Highly Attained (3)**		**Attained (2)**		**Slightly Attained (1)**		**Not Attained (0)**		**Not Applicable (N/A)**		**Mean**	
A. STUDENT PROGRAMS AND SERVICES	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**Value**	**Rank**
1. The school provides the following for enhancement and deepening of science skills:														
a. Science activities (quiz bee, research, exhibit, etc.)	115	40.90	97	34.50	51	18.10	13	4.60	5	1.80	0	0.00	3.08	1
b. Science organizations	69	24.60	91	32.40	75	26.70	35	12.50	10	3.60	1	0.40	2.63	5
c. Science trainings	38	13.50	71	25.30	84	29.90	59	21.00	24	8.50	5	1.80	2.20	11
d. Educational tours/ learning visits/ other co-curricular activities	32	11.40	50	17.80	66	23.50	74	26.30	46	16.40	13	4.60	1.95	12
e. Symposia, seminars, workshops, professional lectures	31	11.00	51	18.10	69	24.60	76	27.00	44	15.70	10	3.60	1.93	13
2. The school encourages involvement of the students in the following:														

a. Regional/ district/ international science competitions	53	18.90	78	27.80	86	30.60	47	16.70	14	5.00	3	1.10	2.42	7
b. Regional/ district/ international science organizations/ campaigns	41	14.60	70	24.90	95	33.80	48	17.10	20	7.10	7	2.50	2.30	10
3. The school informs the students, parents and other stakeholders on science programs and services.	52	18.50	65	23.10	93	33.10	54	19.20	10	3.60	7	2.50	2.41	8
4. There is adequate funding for the conduct of science activities and programs.	54	19.20	65	23.10	87	31.00	52	18.50	18	6.40	5	1.80	2.36	9
B. STUDENT DEVELOPMENT														
1. The school provides adequate staff, physical facilities, equipment and materials for various student science activities.	81	28.80	95	33.80	69	24.60	29	10.30	6	2.10	1	0.40	2.78	3
2. There are clear policies and procedures of student recruitment, selection, and admission in various science activities/ program/ organization/ competition.	84	29.90	93	33.10	72	25.60	26	9.30	5	1.80	1	0.40	2.81	2
3. The school provides opportunities for promotion and appreciation of science.	83	29.50	77	27.40	79	28.10	37	13.20	3	1.10	2	0.70	2.73	4
4. Science development programs are regularly conducted.	62	22.10	61	21.70	91	32.40	50	17.80	12	4.30	5	1.80	2.45	6
OVERALL													2.47	

Table K4

According to Domain D: Library and Instructional Materials

Library and Instructional Materials	**Excellently Attained (4)**		**Highly Attained (3)**		**Attained (2)**		**Slightly Attained (1)**		**Not Attained (0)**		**Not Applicable (N/A)**		**Mean**	
A. COLLECTION DEVELOPMENT, ORGANIZATION AND PRESERVATION	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**Value**	**Rank**
1. The quality and quantity of science books and materials conform with the needs of the students and teachers.	91	32.40	97	34.50	73	26.00	19	6.80	1	0.40	0	0.00	2.92	8
2. The library collection is organized.	143	50.90	89	31.70	34	12.10	12	4.30	1	0.40	2	0.70	3.31	1
3. There are available non-print, digital and electronic science resources.	89	31.70	77	27.40	69	24.60	36	12.80	7	2.50	3	1.10	2.76	11

4. The library maintain a relevant and updated collection.	70	24.90	76	27.00	74	26.30	47	16.70	11	3.90	3	1.10	2.56	12
B. SERVICES AND UTILIZATION														
1. The library provides the following:														
a. On- Line Public Access (OPAC)	85	30.20	79	28.10	71	25.30	21	7.50	16	5.70	9	3.20	2.79	10
b. Inventory reporting	56	19.90	73	26.00	92	32.70	33	11.70	18	6.40	9	3.20	2.51	13
c. Internet searching	131	46.60	75	26.70	52	18.50	8	2.80	10	3.60	5	1.80	3.15	4
d. Photocopying	134	47.70	56	19.90	55	19.60	19	6.80	10	3.60	7	2.50	3.09	5.5
2. The librarians and staff are available during library hours to assist and provide library services.	98	34.90	81	28.80	56	19.90	29	10.30	13	4.60	4	1.40	2.83	9
C. PHYSICAL SET- UP AND FACILITIES														
1. The library is strategically located and accessible to students, faculty and other clientele.	118	42.00	82	29.20	60	21.40	14	5.00	4	1.40	3	1.10	3.09	5.5
2. The size of the library meets standard requirements considering the present enrollment and future expansion.	61	21.70	90	32.00	61	21.70	45	16.00	20	7.10	4	1.40	2.49	14
3. The reading room can accommodate at least 10% of the school enrollment at any given time.	50	17.80	74	26.30	66	23.50	58	20.60	25	8.90	8	2.80	2.32	15
4. The library is well lighted.	127	45.20	70	24.90	53	18.90	24	8.50	5	1.80	2	0.70	3.05	7
5. The library is well ventilated.	138	49.10	76	27.00	48	17.10	15	5.30	3	1.10	1	0.40	3.19	2.5
6. The atmosphere is conducive to learning.	136	48.40	75	26.70	45	16.00	18	6.40	3	1.10	4	1.40	3.19	2.5
OVERALL													2.88	

Appendix L

DESCRIPTIVE STATISTICS OF STUDENT-RESPONSES

Table L1

Physical Facilities

Physical Facilities	PISQ				PSD				Overall		
	M	***SD***	***RANK***	***VI***	***M***	***SD***	***RANK***	***VI***	***M***	**RANK**	**VI**
A. Classrooms											
1. Classroom size is adequate.	2.23	1.18	10	A	2.31	1.05	16	A	2.27	16	A
2. The classrooms are well lighted, ventilated and acoustically conditioned.	2.46	1.01	4	A	2.40	1.13	15	A	2.43	13.5	A
3. The classrooms are provided with enough furniture (tables and chairs) and equipment (TV, projector, speaker, etc.).	1.99	1.13	15	A	2.67	1.15	14	HA	2.33	15	A
4. The cleanliness and orderliness of the classrooms are maintained.	2.11	1.10	13	A	2.21	1.13	17	A	2.16	17	A
AVERAGE	**2.20**			**A**	**2.40**			**A**	2.30		A
B. Science Laboratories											
1. The layout of the science laboratory conform to the particular needs of the students.	2.30	1.03	7	A	2.82	1.03	12	HA	2.56	8.5	HA
2. The laboratory is properly lighted and well ventilated.	2.65	1.02	2	HA	3.02	1.00	7	HA	2.84	2	HA
3. The laboratory has at least two exit doors that open outward.	1.96	1.82	17	A	3.16	1.22	3	HA	2.56	8.5	HA
4. Furniture/ equipment arrangement allows free flow of movement and enables students to work comfortably without interference.	2.12	1.14	12	A	2.74	1.12	13	HA	2.43	13.5	A
5. Usable fire extinguishers, first aid kit, and other emergency materials are accessible to teachers and students.	2.22	1.35	11	A	3.22	0.88	2	HA	2.72	5	HA
6. Gas, water and electricity are utilized for Science experiments and activities.	2.05	1.32	14	A	2.83	1.10	11	HA	2.44	12	A
7. The demonstration table equipped with sink, water, electrical and gas outlets, is available and utilized.	1.98	1.51	16	A	2.97	1.05	9	HA	2.48	11	A
8. The laboratory is neat, clean and orderly.	2.70	1.10	1	HA	3.42	0.79	1	HA	3.06	1	HA
AVERAGE	**2.25**			**A**	**3.02**			**HA**	2.64		HA
C. Equipment, Materials and Supplies											

1. The equipment, instruments, and materials needed in the laboratory are available and sufficient.	2.25	1.04	9	A	2.85	0.93	10	HA	2.55	10	HA
2. Apparatuses, tools and materials conform to the specifications required for the subject.	2.33	1.09	6	A	2.98	0.90	8	HA	2.66	7	HA
3. Laboratory supplies and equipment are properly labeled and are well- kept in separate stock rooms.	2.35	1.15	5	A	3.13	0.96	4	HA	2.74	4	HA
4. The laboratory equipment/ instruments are in good condition and are periodically calibrated.	2.54	1.11	3	HA	3.12	0.88	5	HA	2.83	3	HA
5. Waste disposal of chemicals is efficiently and effectively managed.	2.29	1.26	8	A	3.10	1.01	6	HA	2.70	6	HA
AVERAGE	**2.35**			**A**	**3.04**			**HA**	2.70		HA
AVERAGE	**2.27**			**A**	**2.88**			**HA**	2.58		HA

Table L2

Instruction

	PISQ				**PSD**				**Overall**		
Instruction	***M***	***SD***	***RANK***	***VI***	***M***	***SD***	***RANK***	***VI***	***M***	**RANK**	**VI**
A. Teaching Method and Techniques											
1. Classroom instruction is enriched through the use of the following tools/ strategies:											
a. Textbook	3.19	0.96	4.5	HA	2.80	1.19	17	HA	3.00	13	HA
b. Calculator	2.88	1.06	**18**	HA	2.71	1.04	21	HA	2.80	19	HA
c. Model/ Dummy	2.25	1.67	**29**	A	2.09	1.55	29	A	2.17	29	A
d. Model/ Dummy	2.96	1.08	**15.5**	HA	3.15	0.96	10.5	HA	3.06	12	HA
e. Experiments	2.52	1.24	**25**	HA	2.42	1.18	26	HA	2.47	25	A
f. Problem- Solving	3.11	0.95	**11**	HA	3.24	0.87	6	HA	3.18	8	HA
g. Interactive Learning	2.87	1.04	**19**	HA	2.88	1.04	16	HA	2.88	18	HA
h. Film- Showing/ Video	2.74	1.11	**21**	HA	2.77	1.08	19.5	HA	2.76	20	HA
i. Reporting	3.04	0.97	**12**	HA	2.79	0.97	18	HA	2.92	17	HA
2. The teacher improves the quality of Science instruction by:											
a. Working with other teachers	2.31	1.25	28	A	2.27	1.27	28	A	2.29	28	A
b. Working with other individual students	2.64	1.13	24	HA	2.49	1.11	24	A	2.57	24	HA
c. Communicating with parents	2.16	1.30	30	A	2.05	1.31	30	A	2.11	30	A

3. The science teacher…											
a. has an extensive knowledge of basic science concepts and their applications to daily life and with other disciplines.	3.25	0.91	2	HA	3.26	0.96	5	HA	3.26	2.5	HA
b. updates himself or herself on recent developments in scientific research to motivate learners and make science teaching interesting.	3.13	0.95	9	HA	3.12	0.91	12	HA	3.13	10	HA
c. understands the unique characteristics of learners, their strengths and potential, talents, abilities and perspectives.	2.97	1.03	14	HA	2.89	1.01	15	HA	2.93	16	HA
d. knows a wide range of ways in which learners are likely to learn science best.	2.96	1.02	15.5	HA	2.96	0.99	13.5	HA	2.96	14	HA
e. clarifies and develops students' understanding of scientific concepts under investigation.	2.93	1.07	17	HA	2.96	0.95	13.5	HA	2.95	15	HA
f. knows laboratory equipment, tools, and other instructional materials to be able to work with students with varying learning needs.	3.19	0.94	4.5	HA	3.32	0.90	2	HA	3.26	2.5	HA
g. allows students to ask questions, discuss possible answers to the questions, and make decisions.	3.27	0.95	1	HA	3.23	0.97	7	HA	3.25	4	HA
h. practices safe and proper laboratory techniques for the preparation, storage, dispensing, supervision, and disposal of all science materials used in teaching and learning.	3.12	1.00	10	HA	3.27	0.90	3.5	HA	3.20	7	HA
i. encourages students to read newspaper articles about science, to follow TV programs on new advances in science.	2.37	1.23	27	A	2.45	1.26	25	A	2.41	26.5	A
AVERAGE	**2.85**			**HA**	**2.82**			**HA**	2.84		HA
B. Assessment of Academic Performance											
1. Explains and gives copy of system of evaluation and grading to the students.	2.69	1.04	23	HA	2.77	1.07	19.5	HA	2.73	21	HA
2. Has a system of evaluating the student performance through a combination of the following:											
a. Formative tests such as quizzes, unit test;	3.14	0.87	8	HA	3.27	0.81	3.5	HA	3.21	5.5	HA
b. Summative tests such as mid- quarterly and quarterly examination	3.21	0.89	3	HA	3.20	0.94	8	HA	3.21	5.5	HA
c. Projects	3.15	0.89	6.5	HA	3.44	0.77	1	HA	3.30	1	HA

d. Performance tests/ practical tests	3.15	0.96	6.5	HA	3.18	0.93	9	HA	3.17	9	HA
e. Reflection/ reaction papers	2.44	1.23	26	A	2.38	1.29	27	A	2.41	26.5	A
3. Assists students with academic deficiencies and other problems which may affect their grades.	2.81	1.07	20	HA	2.64	1.00	22	HA	2.73	22	HA
4. Gives recognition for exemplary academic and non-academic performances.	2.70	1.04	22	HA	2.62	1.02	23	HA	2.66	23	HA
5. Returns and discusses answers or results of the tests.	3.02	1.02	13	HA	3.15	0.99	10.5	HA	3.09	11	HA
AVERAGE	**2.92**			**HA**	**2.96**			**HA**	**2.94**		**HA**
AVERAGE	**2.87**			**HA**	**2.86**			**HA**	**2.87**		**HA**

Table L3

Support to Students

	PISQ				PSD				Overall		
Support to Students	***M***	***SD***	***RANK***	***VI***	***M***	***SD***	***RANK***	***VI***	***M***	**RANK**	**VI**
A. Student Programs and Services											
1. The school provides the following for enhancement and deepening of science skills:											
a. Science activities (quiz bee, research, exhibit, etc.)	3.01	1.00	1	HA	3.08	0.97	1	HA	3.05	1	HA
b. Science organizations	2.45	1.18	4	A	2.63	1.10	5	HA	2.54	4	HA
c. Science trainings	1.93	1.21	11	A	2.20	1.21	11	A	2.07	11	A
d. Educational tours/ learning visits/ other co- curricular activities	1.88	1.41	12	A	1.95	1.40	12	A	1.92	12	A
e. Symposia, seminars, workshops, professional lectures	1.83	1.36	13	A	1.93	1.36	13	A	1.88	13	A
2. The school encourages involvement of the students in the following:											
a. Regional/ district/ international science competitions	2.16	1.18	8	A	2.42	1.15	7	A	2.29	8	A
b. Regional/ district/ international science organizations/ campaigns	2.09	1.26	10	A	2.30	1.19	10	A	2.20	10	A
3. The school informs the students, parents and other stakeholders on science programs and services.	2.28	1.22	6	A	2.41	1.17	8	A	2.35	7	A
4. There is adequate funding for the conduct of science activities and programs.	2.14	1.20	9	A	2.36	1.22	9	A	2.25	9	A
AVERAGE	**2.20**			**A**	**2.36**			**A**	2.28		A
B. Student Development											

1. The school provides adequate staff, physical facilities, equipment and materials for various student science activities.	2.55	1.04	2	HA	2.78	1.05	3	HA	2.67	2	HA
2. There are clear policies and procedures of student recruitment, selection, and admission in various science activities/ program/ organization/ competition.	2.48	1.02	3	A	2.81	1.03	2	HA	2.65	3	HA
3. The school provides opportunities for promotion and appreciation of science.	2.34	1.09	5	A	2.73	1.08	4	HA	2.54	5	HA
4. Science development programs are regularly conducted.	2.27	1.15	7	A	2.45	1.19	6	HA	2.36	6	A
AVERAGE	**2.41**			**A**	**2.69**			**HA**	**2.55**		**HA**
AVERAGE	**2.26**			**A**	**2.47**			**A**	**2.37**		**A**

Table L4

Library and Instructional Materials

	PISQ				**PSD**				**Overall**		
Library and Instructional Materials	***M***	***SD***	***RANK***	***VI***	***M***	***SD***	***RANK***	***VI***	***M***	**RANK**	**VI**
A. Collection Development, Organization and Preservation											
1. The quality and quantity of science books and materials conform with the needs of the students and teachers.	2.82	0.98	2.5	HA	2.92	0.94	8	HA	2.87	6	HA
2. The library collection is organized.	2.95	1.05	1	HA	3.31	0.88	1	HA	3.13	1	HA
3. There are available non-print, digital and electronic science resources.	2.30	1.25	10	A	2.76	1.14	11	HA	2.53	10	HA
4. The library maintain a relevant and updated collection.	2.38	1.23	9	A	2.56	1.18	12	HA	2.47	11	A
AVERAGE	**2.61**			**HA**	**2.89**			**HA**	2.75		HA
B. Services and Utilization											
1. The library provides the following:											NA
a. On- Line Public Access (OPAC)	2.06	1.47	13	A	2.79	1.21	10	HA	2.43	13	A
b. Inventory reporting	1.97	1.30	15	A	2.51	1.21	13	HA	2.24	14	A
c. Internet searching	2.01	1.51	14	A	3.15	1.07	4	HA	2.58	8.5	HA
d. Photocopying	2.07	1.51	12	A	3.09	1.17	5.5	HA	2.58	8.5	HA
2. The librarians and staff are available during library hours to assist and provide library services.	2.55	1.21	7	HA	2.83	1.19	9	HA	2.69	7	HA
AVERAGE	**2.14**			**A**	**2.88**			**HA**	2.51		HA
C. Physical Set- Up and Facilities											

1. The library is strategically located and accessible to students, faculty and other clientele.	2.68	1.05	6	HA	3.09	1.00	5.5	HA	2.89	5	HA
2. The size of the library meets standard requirements considering the present enrollment and future expansion.	2.41	1.16	8	A	2.49	1.23	14	A	2.45	12	A
3. The reading room can accommodate at least 10% of the school enrollment at any given time.	2.13	1.23	11	A	2.32	1.30	15	A	2.23	15	A
4. The library is well lighted.	2.73	1.14	5	HA	3.05	1.08	7	HA	2.89	4	HA
5. The library is well ventilated.	2.82	1.11	2.5	HA	3.19	0.98	2.5	HA	3.01	2	HA
6. The atmosphere is conducive to learning.	2.76	1.12	4	HA	3.19	1.01	2.5	HA	2.98	3	HA
AVERAGE	**2.59**			**HA**	**2.89**			**HA**	2.74		HA
AVERAGE	**2.44**			**A**	**2.88**			**HA**	2.66		HA

Appendix M

DESCRIPTIVE STATISTICS OF FACULTY-RESPONSES

Table M1

Physical Facilities

Physical Facilities	PISQ				PSD				Overall		
	M	***SD***	**RANK**	**VI**	***M***	***SD***	**RANK**	**VI**	***M***	**Rank**	**VI**
A. Classrooms											
1. Classroom size is adequate and meets standard specifications (1.5 sq.m. per student) for instruction.	2.00	.82	5	A	1.75	.50	20	A	1.88	11	A
2. The classrooms are well lighted, ventilated and acoustically conditioned.	2.75	.50	2	HA	2.25	.96	14	A	2.50	2	HA
3. The classrooms are provided with enough furniture (tables and chairs) and equipment (TV, projector, speaker, etc.).	1.50	.58	9	A	3.00	.82	2	HA	2.25	5	A
4. The cleanliness and orderliness of the classrooms are maintained.	2.75	.50	2	HA	2.50	.58	11	HA	2.63	1	HA
AVERAGE	**2.25**			**A**	**2.38**			**A**	2.32		A
B. Science Laboratories											
1. The layout of the science laboratory conform with acceptable standards (Building Code of Qatar/ Code of Sanitation of Qatar) and to the particular needs of the students.	2.00	.82	5	A	2.00	.82	17	A	2.00	8.5	A
2. The laboratory is properly lighted and well ventilated.	2.25	.50	3	A	2.00	.82	17	A	2.13	7	A
3. The laboratory has at least two exit doors that open outward.	.75	.50	19	SA	1.50	1.29	22	A	1.13	22	SA
4. Furniture/ equipment arrangement allows free flow of movement and enables students to work comfortably without interference.	1.50	.58	9	A	1.75	.96	20	A	1.63	16.5	A
5. Safety and precautionary measures are implemented.	1.75	.96	7	A	3.00	.82	2	HA	2.38	3	A
6. Usable fire extinguishers, first aid kit, and other emergency materials are accessible to teachers and students.	1.50	1.29	9	A	3.00	.82	2	HA	2.25	5	A
7. Laboratory operation manuals for the faculty and students are provided.	1.25	.96	12	SA	2.75	.96	6	HA	2.00	8.5	A

8. Gas, water and electricity are utilized for Science experiments and activities.	1.25	1.26	12	SA	2.25	.50	14	A	1.75	13.5	A
9. The demonstration table equipped with sink, water, electrical and gas outlets, is available and utilized.	.75	.96	19	SA	1.75	.50	20	A	1.25	21	SA
10. The laboratory is neat, clean and orderly.	1.75	1.26	7	A	2.75	1.26	6	HA	2.25	5	A
AVERAGE	**1.48**			**SA**	**2.28**			**A**	1.88		A
C. Equipment, Materials and Supplies											
1. The equipment, instruments, and materials needed in the laboratory are available and sufficient.	1.00	.82	15	SA	2.00	.82	17	A	1.50	19.5	A
2. Apparatuses, tools and materials conform to the specifications required for the subject.	.75	.50	19	SA	2.50	.58	11	HA	1.63	16.5	A
3. A trained laboratory technician/ assistant is available for the proper upkeep of the laboratory.	1.00	1.15	15	SA	2.25	.50	14	A	1.63	16.5	A
4. Laboratory supplies and equipment are properly labeled and are well- kept in separate stock rooms.	1.00	1.15	15	SA	2.75	1.26	6	HA	1.88	11	A
5. Laboratory materials and supplies are regularly replenished/ replaced whenever applicable.	1.00	.82	15	SA	2.75	1.26	6	HA	1.88	11	A
6. The inventory of laboratory facilities and equipment is systematically and periodically conducted.	.75	.50	19	SA	2.50	1.29	11	HA	1.63	16.5	A
7. The laboratory equipment/ instruments are in good condition and are periodically calibrated.	.75	.96	19	SA	2.75	.96	6	HA	1.75	13.5	A
8. Waste disposal of chemicals is efficiently and effectively managed.	.50	.58	22	SA	2.50	1.00	11	HA	1.50	19.5	A
AVERAGE	**0.84**			**SA**	**2.50**			**HA**	1.67		A
AVERAGE	**1.39**			**SA**	**2.38**			**A**	1.89		A

Table M2
Instruction

	PISQ				PSD				Overall		
Instruction	***M***	***SD***	**RANK**	**VI**	***M***	***SD***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Teaching Method and Techniques											
1. Classroom instruction is enriched through the use of the following tools/ strategies:											
A. Textbook	3.25	.50	4.5	HA	3.25	.96	15	HA	3.25	6	HA
B. Calculator	3.25	.50	4.5	HA	3.00	1.41	27	HA	3.13	13.5	HA

C. Model/ Dummy	3.25	.50	4.5	HA	3.00	1.41	27	HA	3.13	13.5	HA
D. Group Work/ Pair Work	3.00	.82	12.5	HA	3.50	1.00	6	EA	3.25	6	HA
E. Experiments	3.25	.50	4.5	HA	3.25	.96	15	HA	3.25	6	HA
F. Problem- Solving	3.25	.50	4.5	HA	3.00	.82	27	HA	3.13	13.5	HA
G. Interactive Learning	3.25	.50	4.5	HA	3.00	1.41	27	HA	3.13	13.5	HA
H. Film- Showing/ Video	3.25	.50	4.5	HA	3.00	1.41	27	HA	3.13	13.5	HA
I. Reporting	3.25	.50	4.5	HA	3.00	.82	27	HA	3.13	13.5	HA
2. The teacher improves the quality of Science instruction by:											NA
A. Working with other teachers	2.75	.96	24.5	HA	3.00	.82	27	HA	2.88	28.5	HA
B. Working with other individual students	3.00	.82	12.5	HA	3.00	.82	27	HA	3.00	21	HA
C. Communicating with parents	3.00	.82	12.5	HA	2.75	1.26	34	HA	2.88	28.5	HA
3. The science teacher…											NA
A. has an extensive knowledge of basic science concepts and their applications to daily life and with other disciplines.	2.75	.96	24.5	HA	3.00	1.41	27	HA	2.88	28.5	HA
B. has mastery of concepts considered important for all students.	2.75	.96	24.5	HA	3.25	.96	15	HA	3.00	21	HA
C. can identify and address science misconceptions of students and in textbooks.	2.75	.96	24.5	HA	3.25	.96	15	HA	3.00	21	HA
D. updates himself or herself on recent developments in scientific research to motivate learners and make science teaching interesting.	2.75	.96	24.5	HA	3.25	1.50	15	HA	3.00	21	HA
E. understands the unique characteristics of learners, their strengths and potential, talents, abilities and perspectives.	2.75	.96	24.5	HA	2.75	1.26	34	HA	2.75	33.5	HA
F. knows how to plan and design strategies to support the intellectual, social, and personal development of each student.	2.75	.96	24.5	HA	3.25	.96	15	HA	3.00	21	HA
G. knows how to develop learners' deeper understanding of subject matter.	2.75	.96	24.5	HA	3.25	.96	15	HA	3.00	21	HA
H. knows a wide range of ways in which learners are likely to learn science best.	2.75	.96	24.5	HA	3.00	.82	27	HA	2.88	28.5	HA
I. clarifies and develops students' understanding of scientific concepts under investigation.	2.75	.96	24.5	HA	3.00	.82	27	HA	2.88	28.5	HA
J. knows laboratory equipment, tools, and other instructional materials to be able to work with students with varying learning needs.	2.75	1.26	24.5	HA	3.25	.96	15	HA	3.00	21	HA
K. allows students to ask questions, discuss possible answers to the questions, and make decisions.	2.75	.96	24.5	HA	3.25	.96	15	HA	3.00	21	HA

L. practices safe and proper laboratory techniques for the preparation, storage, dispensing, supervision, and disposal of all science materials used in teaching and learning.	2.25	1.71	35.0	A	3.25	.96	15	HA	2.75	33.5	HA
M. provides learners with opportunities to identify relevant science topics and issues (including personal and social issues).	2.50	1.00	33.5	HA	3.00	.82	27	HA	2.75	33.5	HA
N. encourages students to read newspaper articles about science, to follow TV programs on new advances in science.	2.50	1.00	33.5	HA	3.25	.96	15	HA	2.88	28.5	HA
AVERAGE	**2.89**			**HA**	**3.11**			**HA**	3.00		HA
B. Assessment of Academic Performance				HA				HA			HA
1. Explains and gives copy of system of evaluation and grading to the students.	2.75	.96	24.5		3.25	.96	15		3.00	21	NA
2. Has a system of evaluating the student performance through a combination of the following:				HA				EA			HA
A. Formative tests such as quizzes, unit test;	3.00	.82	12.5	HA	3.50	1.00	6	EA	3.25	6	HA
B. Summative tests such as mid- quarterly and quarterly examination	3.00	.82	12.5	HA	3.50	1.00	6	EA	3.25	6	HA
C. Projects	3.00	.82	12.5	HA	3.50	1.00	6	EA	3.25	6	HA
D. Performance tests/ practical tests	2.75	.96	24.5	HA	3.75	.50	2	EA	3.25	6	HA
E. Reflection/ reaction papers	3.00	.82	12.5	HA	3.75	.50	2	HA	3.38	1	HA
3. Assists students with academic deficiencies and other problems which may affect their grades.	2.75	.96	24.5	HA	2.75	1.26	34	EA	2.75	33.5	HA
4. Gives recognition for exemplary academic and non-academic performances.	2.75	.96	24.5	HA	3.75	.50	2	EA	3.25	6	HA
5. Returns and discusses answers or results of the tests.	3.00	.82	12.5	**HA**	3.50	.58	6	**HA**	3.25	6	HA
AVERAGE	**2.89**			**HA**	**3.47**			**HA**	**3.18**		**HA**
AVERAGE	**2.89**			HA	**3.20**			**HA**	**3.05**		**HA**

Table M3

Content

	PISQ				**PSD**				**Overall**		
Content	***M***	***SD***	**RANK**	**VI**	***M***	***SD***	**RANK**	**VI**	**M**	**RANK**	**VI**
1. Meets the needs and provides opportunities for students in the advancement of science learning.	2.75	.96	4	HA	3.25	.50	4.5	HA	3.00	5	HA

2. Encourages students to develop their innate talents and skills to become productive citizens.	3.00	.82	1	HA	3.25	.50	4.5	HA	3.13	2	HA
3. Provides opportunity in developing decision- making ability to become life- long learners.	2.75	.96	4	HA	3.25	.50	4.5	HA	3.00	5	HA
4. Provides activities for scientific and creative thinking skills.	2.75	.96	4	HA	3.25	.50	4.5	HA	3.00	5	HA
5. Develops or enhances self- confidence through group dynamics in science learning.	2.75	.96	4	HA	3.50	.58	1.5	EA	3.13	2	HA
6. Provides opportunity to be globally aware and competitive.	2.75	.96	4	HA	3.50	.58	1.5	EA	3.13	2	HA
AVERAGE	**2.79**			**HA**	**3.33**			**HA**	**3.06**		**HA**

Table M4

Support to Students

	PISQ				PSD				Overall		
Support to Students	***M***	***SD***	***RANK***	***VI***	***M***	***SD***	***RANK***	***VI***	***M***	***RANK***	***VI***
A. Student Programs and Services											
1. The school provides the following for enhancement and deepening of science skills:											
A. Science activities (quiz bee, research, exhibit, etc.)	2.75	.96	2.5	HA	3.50	.58	4	EA	3.13	2	HA
B. Science organizations	2.50	.58	8.5	HA	3.50	.58	4	EA	3.00	6	HA
C. Science trainings	2.50	.58	8.5	HA	3.50	.58	4	EA	3.00	6	HA
D. Educational tours/ learning visits/ other co- curricular activities	2.50	.58	8.5	HA	3.00	.82	13	HA	2.75	12	HA
E. Symposia, seminars, workshops, professional lectures	2.50	.58	8.5	HA	3.50	1.00	4	EA	3.00	6	HA
2. The school encourages involvement of the students in the following:											
A. Regional/ district/ international science competitions	2.75	.96	2.5	HA	3.50	.58	4	EA	3.13	2	HA
B. Regional/ district/ international science organizations/ campaigns	2.75	.96	2.5	HA	3.50	.58	4	EA	3.13	2	HA
3. The school informs the students, parents and other stakeholders on science programs and services.	2.75	.96	2.5	HA	3.25	.96	10	HA	3.00	6	HA
4. There is adequate funding for the conduct of science activities and programs.	2.50	.58	8.5	HA	3.25	.96	10	HA	2.88	9.5	HA
AVERAGE	**2.61**			HA	3.39			HA	3.00		HA

B. Student Development											
1. The school provides adequate staff, physical facilities, equipment and materials for various student science activities.	2.25	.96	13.0	A	3.25	.96	10	HA	2.75	12	HA
2. There are clear policies and procedures of student recruitment, selection, and admission in various science activities/ program/ organization/ competition.	2.50	.58	8.5	HA	3.25	.50	10	HA	2.88	9.5	HA
3. The school provides opportunities for promotion and appreciation of science.	2.50	.58	8.5	HA	3.50	.58	4	EA	3.00	6	HA
4. Science development programs are regularly conducted.	2.50	.58	8.5	HA	3.00	.82	13	HA	2.75	12	HA
AVERAGE	**2.40**			**A**	**3.25**			**HA**	**2.83**		**HA**
AVERAGE	**2.56**			**HA**	**3.35**			**HA**	**2.96**		**HA**

Table M5

Library and Instructional Materials

	PISQ				**PSD**				**Overall**		
Library and Instructional Materials	***M***	***SD***	**RANK**	**VI**	***M***	***SD***	**RANK**	**VI**	**M**	**RANK**	**VI**
A. Collection Development, Organization and Preservation											
1. The quality and quantity of science books and materials conform with the needs of the students and teachers.	2.50	1.29	1	HA	2.50	.58	6	HA	2.50	1.5	HA
2. The library collection is organized.	2.00	0.82	6	A	2.25	.50	12	A	2.13	9	A
3. There are available non- print, digital and electronic science resources.	2.00	0.82	6	A	2.75	.96	3	HA	2.38	3.5	A
4. The library maintain a relevant and updated collection.	1.75	0.50	11	A	2.25	.50	12	A	2.00	12.5	A
AVERAGE	**2.06**			**A**	2.44			**A**	2.25		A
B. Services and Utilization											NA
1. The library provides the following:				A				HA			A
A. On- Line Public Access (OPAC)	1.75	0.50	11	A	2.50	2.38	6	A	2.13	9	A
B. Inventory reporting	1.50	0.58	14	A	2.00	1.83	15	HA	1.75	15	A
C. Internet searching	1.50	0.58	14	A	2.75	1.26	3	HA	2.13	9	A
D. Photocopying	2.25	1.26	2	A	2.50	1.29	6	HA	2.38	3.5	HA
2. The librarians and staff are available during library hours to assist and provide library services.	2.00	1.41	6	**A**	3.00	.82	1	**HA**	2.50	1.5	A
AVERAGE	**1.80**			A	2.55			HA	2.18		A

C. Physical Set- Up and Facilities				A				A			A
1. The library is strategically located and accessible to students, faculty and other clientele.	2.00	1.41	6	A	2.50	1.29	6	A	2.25	5.5	A
2. The size of the library meets standard requirements considering the present enrollment and future expansion.	1.50	1.29	14	A	2.25	.50	12	HA	1.88	14	A
3. The reading room can accommodate at least 10% of the school enrollment at any given time.	1.75	1.71	11	A	2.25	.50	12	A	2.00	12.5	A
4. The library is well lighted.	2.00	1.63	6	A	2.50	1.00	6	A	2.25	5.5	A
5. The library is well ventilated.	2.00	1.63	6	**A**	2.25	.96	12	**A**	2.13	9	A
6. The atmosphere is conducive to learning.	2.00	1.63	6	**A**	2.25	.96	12	**A**	2.13	9	A
AVERAGE	**1.88**			**HA**	**2.33**			**HA**	**2.11**		**HA**
AVERAGE	**1.90**			**A**	**2.43**			**A**	**2.17**		**A**

Table M6
Administration

	PISQ				PSD				Overall		
Administration	***M***	***SD***	**RANK**	**VI**	***M***	***SD***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Academic Administration											
1. The administrators have appropriate/ relevant educational qualification and experience.	2.25	1.26	13	A	3.50	1.00	3	EA	2.88	5.5	HA
2. The administrators implement a supervisory program.	2.50	1.00	8	HA	3.25	0.96	8	HA	2.88	5.5	HA
3. The administrators and the faculty work together for the improvement of the Science area, particularly in:											
A. Setting standards and targets	2.50	1.00	8	HA	3.00	0.82	15	HA	2.75	11.5	HA
B. Planning of programs and other related activities	2.50	1.00	8	HA	3.25	0.50	8	HA	2.88	5.5	HA
C. Implementing, monitoring and evaluation of plans, programs and other related activities	2.50	1.00	8	HA	3.25	0.50	8	HA	2.88	5.5	HA
D. Providing opportunities for professional growth and development for the faculty	2.50	1.00	8	HA	3.50	0.58	3	EA	3.00	2	HA
E. Preparing guidelines on the proper use and maintenance of facilities, apparatuses, tools and materials, etc.	2.50	1.00	8	HA	3.25	0.50	8	HA	2.88	5.5	HA
AVERAGE	**2.46**			**A**	3.29			**HA**	2.88		HA
B. Student Administration											

1. Students are provided opportunities to participate in the planning and implementation of science activities.	2.00	0.82	15	A	3.50	0.58	3	EA	2.75	11.5	HA
2. Concerned officials, faculty and staff act promptly on request, needs and problems of the students.	2.25	1.26	13	A	3.25	0.50	8	HA	2.75	11.5	HA
3. The administration, faculty, staff and students work harmoniously and maintain good relationship.	2.50	1.00	8	HA	3.00	0.82	15	HA	2.75	11.5	HA
AVERAGE	**2.25**			**A**	3.25			**HA**	2.75		HA
C. Financial Management											
1. The school allocates funds for the following Science related activities and services:											
A. Improvement of laboratory	1.50	0.58	19	A	3.00	0.82	15	HA	2.25	19	A
B. Repair and maintenance of facilities and equipment	1.50	1.00	19	A	3.00	0.82	15	HA	2.25	19	A
C. Purchase of new equipment, supplies and materials	1.50	0.58	19	A	3.00	0.82	15	HA	2.25	19	A
D. Participation in competitions and campaigns	1.50	0.58	19	A	3.25	0.50	8	EA	2.38	16.5	A
E. Partnership with organization/ club	1.75	0.50	16	A	3.00	0.82	15	HA	2.38	16.5	A
2. The administrative officials, staff, faculty and student representatives participate in the budget preparation and procurement of science apparatuses, tools and materials.	2.00	0.82	15	A	3.25	0.96	8	HA	2.63	15	HA
AVERAGE	**1.63**			**A**	3.08			**HA**	2.36		A
D. Faculty Administration											
1. Regular classroom observation/ supervision	2.75	0.96	3	HA	2.75	0.96	20	HA	2.75	11.5	HA
2. Regular faculty performance evaluation	2.75	0.96	3	HA	3.00	0.82	15	HA	2.88	5.5	HA
3. Attendance/ participation of faculty in science related trainings and seminars	2.75	0.96	3	HA	3.50	1.00	3	EA	3.13	1	HA
4. Encouragement of faculty members to produce their own instructional materials such as modules, visual aids, manuals and textbooks.	2.75	0.96	3	HA	2.75	1.50	20	HA	2.75	11.5	HA
AVERAGE	**2.75**			**HA**	**3.00**			**HA**	**2.88**		**HA**
AVERAGE	**2.24**			**A**	**3.16**			**HA**	**2.70**		**HA**

Appendix N

DESCRIPTIVE STATISTICS OF ADMINISTRATOR-RESPONSES

Table N1

Physical Facilities

Physical Facilities	PISQ			PSD			Overall		
	M	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Classrooms									
1. Classroom size is adequate and meets standard specifications (1.5 sq.m. per student) for instruction.	3.00	17	HA	1.00	22	SA	2.00	22	A
2. The classrooms are well lighted, ventilated and acoustically conditioned.	4.00	6	EA	4.00	3	EA	4.00	1.5	EA
3. The classrooms are provided with enough furniture (tables and chairs) and equipment (TV, projector, speaker, etc.).	4.00	6	EA	4.00	3	EA	4.00	1.5	EA
4. The cleanliness and orderliness of the classrooms are maintained.	3.00	17	HA	4.00	3	EA	3.50	5.5	EA
AVERAGE	**3.50**		**EA**	**3.25**		**EA**	**3.38**		**HA**
B. Science Laboratories									
1. The layout of the science laboratory conform with acceptable standards (Building Code of Qatar/ Code of Sanitation of Qatar) and to the particular needs of the students.	3.00	17	HA	3.00	10	HA	3.00	13.5	HA
2. The laboratory is properly lighted and well ventilated.	3.00	17	HA	4.00	3	EA	3.50	5.5	EA
3. The laboratory has at least two exit doors that open outward.	3.00	17	HA	4.00	3	EA	3.50	5.5	EA
4. Furniture/ equipment arrangement allows free flow of movement and enables students to work comfortably without interference.	4.00	6	EA	3.00	10	HA	3.50	5.5	EA
5. Safety and precautionary measures are implemented.	4.00	6	EA	3.00	10	HA	3.50	5.5	EA
6. Usable fire extinguishers, first aid kit, and other emergency materials are accessible to teachers and students.	4.00	6	EA	2.00	18	A	3.00	13.5	HA
7. Laboratory operation manuals for the faculty and students are provided.	4.00	6	EA	2.00	18	A	3.00	13.5	HA
8. Gas, water and electricity are utilized for Science experiments and activities.	3.00	17	HA	2.00	18	A	2.50	20	HA
9. The demonstration table equipped with sink, water, electrical and gas outlets, is available and utilized.	3.00	17	HA	2.00	18	A	2.50	20	HA
10. The laboratory is neat, clean and orderly.	4.00	6	EA	2.00	18	A	3.00	13.5	HA

AVERAGE	**3.50**		**EA**	**2.70**		**HA**	**3.10**		**HA**
C. Equipment, Materials and Supplies									
1. The equipment, instruments, and materials needed in the laboratory are available and sufficient.	4.00	6	EA	2.00	18	A	3.00	13.5	HA
2. Apparatuses, tools and materials conform to the specifications required for the subject.	4.00	6	EA	2.00	18	A	3.00	13.5	HA
3. A trained laboratory technician/ assistant is available for the proper upkeep of the laboratory.	3.00	17	HA	2.00	18	A	2.50	20	HA
4. Laboratory supplies and equipment are properly labeled and are well-kept in separate stock rooms.	3.00	17	HA	3.00	10	HA	3.00	13.5	HA
5. Laboratory materials and supplies are regularly replenished/ replaced whenever applicable.	4.00	6	EA	3.00	10	HA	3.50	5.5	EA
6. The inventory of laboratory facilities and equipment is systematically and periodically conducted.	3.00	17	HA	3.00	10	HA	3.00	13.5	HA
7. The laboratory equipment/ instruments are in good condition and are periodically calibrated.	3.00	17	HA	3.00	10	HA	3.00	13.5	HA
8. Waste disposal of chemicals is efficiently and effectively managed.	3.00	17	HA	3.00	10	HA	3.00	13.5	HA
AVERAGE	**3.38**		**HA**	**2.63**		**HA**	**3.01**		**HA**
AVERAGE	**3.45**		**HA**	**2.77**		**HA**	**3.11**		**HA**

Table N2

Instruction

	PISQ			**PSD**			**Overall**		
Instruction	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Teaching Method and Techniques									
1. Classroom instruction is enriched through the use of the following tools/ strategies:									
A. Textbook	4.00	3	EA	3.00	23	HA	3.50	7.5	EA
B. Calculator	3.00	21	HA	3.00	23	HA	3.00	25	HA
C. Model/ Dummy	3.00	21	HA	3.00	23	HA	3.00	25	HA
D. Group Work/ Pair Work	3.00	21	HA	3.00	23	HA	3.00	25	HA
E. Experiments	3.00	21	HA	3.00	23	HA	3.00	25	HA
F. Problem- Solving	3.00	21	HA	3.00	23	HA	3.00	25	HA

G. Interactive Learning	3.00	21	HA	3.00	23	HA	3.00	25	HA
H. Film- Showing/ Video	3.00	21	HA	3.00	23	HA	3.00	25	HA
I. Reporting	3.00	21	HA	3.00	23	HA	3.00	25	HA
2. The teacher improves the quality of Science instruction by:									
A. Working with other teachers	4.00	3	EA	3.00	23	HA	3.50	7.5	EA
B. Working with other individual students	4.00	3	EA	3.00	23	HA	3.50	7.5	EA
C. Communicating with parents	3.00	21	HA	3.00	23	HA	3.00	25	HA
3. The science teacher…									
A. has an extensive knowledge of basic science concepts and their applications to daily life and with other disciplines.	4.00	3	EA	3.00	23	HA	3.50	7.5	EA
B. has mastery of concepts considered important for all students.	4.00	3	EA	3.00	23	HA	3.50	7.5	EA
C. can identify and address science misconceptions of students and in textbooks.	3.00	21	HA	3.00	23	HA	3.00	25	HA
D. updates himself or herself on recent developments in scientific research to motivate learners and make science teaching interesting.	3.00	21	HA	3.00	23	HA	3.00	25	HA
E. understands the unique characteristics of learners, their strengths and potential, talents, abilities and perspectives.	3.00	21	HA	3.00	23	HA	3.00	25	HA
F. knows how to plan and design strategies to support the intellectual, social, and personal development of each student.	3.00	21	HA	3.00	23	HA	3.00	25	HA
G. knows how to develop learners' deeper understanding of subject matter.	3.00	21	HA	3.00	23	HA	3.00	25	HA
H. knows a wide range of ways in which learners are likely to learn science best.	3.00	21	HA	3.00	23	HA	3.00	25	HA
I. clarifies and develops students' understanding of scientific concepts under investigation.	3.00	21	HA	3.00	23	HA	3.00	25	HA
J. knows laboratory equipment, tools, and other instructional materials to be able to work with students with varying learning needs.	3.00	21	HA	4.00	5	EA	3.50	7.5	EA
K. allows students to ask questions, discuss possible answers to the questions, and make decisions.	3.00	21	HA	3.00	23	HA	3.00	25	HA
L. practices safe and proper laboratory techniques for the preparation, storage, dispensing, supervision, and disposal of all science materials used in teaching and learning.	3.00	21	HA	3.00	23	HA	3.00	25	HA
M. provides learners with opportunities to identify relevant science topics and issues (including personal and social issues).	3.00	21	HA	3.00	23	HA	3.00	25	HA
N. encourages students to read newspaper articles about science, to follow TV programs on new advances in science.	3.00	21	HA	3.00	23	HA	3.00	25	HA
AVERAGE	**3.19**		**HA**	**3.04**		**HA**	3.12		HA

B. Assessment of Academic Performance									
1. Explains and gives copy of system of evaluation and grading to the students.	3.00	21	HA	3.00	23	HA	3.00	25	HA
2. Has a system of evaluating the student performance through a combination of the following:									
A. Formative tests such as quizzes, unit test;	3.00	21	HA	4.00	5	EA	3.50	7.5	EA
B. Summative tests such as mid- quarterly and quarterly examination	3.00	21	HA	4.00	5	EA	3.50	7.5	EA
C. Projects	3.00	21	HA	4.00	5	EA	3.50	7.5	EA
D. Performance tests/ practical tests	3.00	21	HA	4.00	5	EA	3.50	7.5	EA
E. Reflection/ reaction papers	3.00	21	HA	4.00	5	EA	3.50	7.5	EA
3. Assists students with academic deficiencies and other problems which may affect their grades.	3.00	21	HA	4.00	5	EA	3.50	7.5	EA
4. Gives recognition for exemplary academic and non- academic performances.	3.00	21	HA	4.00	5	EA	3.50	7.5	EA
5. Returns and discusses answers or results of the tests.	3.00	21	HA	4.00	5	EA	3.50	7.5	EA
AVERAGE	**3.00**		**HA**	**3.89**		**EA**	**3.45**		**HA**
AVERAGE	**3.14**		**HA**	**3.26**		**EA**	**3.20**		**HA**

Table N3

Content

	PISQ			**PSD**			**Overall**		
Content	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
1. Meets the needs and provides opportunities for students in the advancement of science learning.	3.00	3.5	HA	3.00	3.5	HA	3.00	3.5	HA
2. Encourages students to develop their innate talents and skills to become productive citizens.	3.00	3.5	HA	3.00	3.5	HA	3.00	3.5	HA
3. Provides opportunity in developing decision- making ability to become life- long learners.	3.00	3.5	HA	3.00	3.5	HA	3.00	3.5	HA
4. Provides activities for scientific and creative thinking skills.	3.00	3.5	HA	3.00	3.5	HA	3.00	3.5	HA
5. Develops or enhances self- confidence through group dynamics in science learning.	3.00	3.5	HA	3.00	3.5	HA	3.00	3.5	HA
6. Provides opportunity to be globally aware and competitive.	3.00	3.5	HA	3.00	3.5	HA	3.00	3.5	HA
AVERAGE	**3.00**		**HA**	**3.00**		**HA**	**3.00**		**HA**

Table N4

Support to Students

Support to Students	PISQ			PSD			Overall		
	M	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Student Programs and Services									
1. The school provides the following for enhancement and deepening of science skills:									
A. Science activities (quiz bee, research, exhibit, etc.)	3.00	7	HA	4.00	4	EA	3.50	4	EA
B. Science organizations	3.00	7	HA	4.00	4	EA	3.50	4	EA
C. Science trainings	3.00	7	HA	4.00	4	EA	3.50	4	EA
D. Educational tours/ learning visits/ other co- curricular activities	3.00	7	HA	4.00	4	EA	3.50	4	EA
E. Symposia, seminars, workshops, professional lectures	3.00	7	HA	4.00	4	EA	3.50	4	EA
2. The school encourages involvement of the students in the following:									
A. Regional/ district/ international science competitions	3.00	7	HA	4.00	4	EA	3.50	4	EA
B. Regional/ district/ international science organizations/ campaigns	3.00	7	HA	4.00	4	EA	3.50	4	EA
3. The school informs the students, parents and other stakeholders on science programs and services.	3.00	7	HA	3.00	11	HA	3.00	10.5	HA
4. There is adequate funding for the conduct of science activities and programs.	3.00	7	HA	3.00	11	HA	3.00	10.5	HA
AVERAGE	**3.00**		**HA**	**3.78**		**EA**	3.39		HA
B. Student Development									
1. The school provides adequate staff, physical facilities, equipment and materials for various student science activities.	3.00	7	HA	3.00	11	HA	3.00	10.5	HA
2. There are clear policies and procedures of student recruitment, selection, and admission in various science activities/ program/ organization/ competition.	3.00	7	HA	3.00	11	HA	3.00	10.5	HA
3. The school provides opportunities for promotion and appreciation of science.	3.00	7	HA	3.00	11	HA	3.00	10.5	HA
4. Science development programs are regularly conducted.	3.00	7	HA	3.00	11	HA	3.00	10.5	HA
AVERAGE	**3.00**		**HA**	**3.00**		**HA**	**3.00**		**HA**
AVERAGE	**3.00**		**HA**	**3.54**		**EA**	**3.27**		**HA**

Table N5

Library and Instructional Materials

Library and Instructional Materials	PISQ			PSD			Overall		
	M	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Collection Development, Organization and Preservation									
1. The quality and quantity of science books and materials conform with the needs of the students and teachers.	4.00	3	EA	3.00	8.5	HA	3.50	4	EA
2. The library collection is organized.	3.00	9	HA	3.00	8.5	HA	3.00	10	HA
3. There are available non- print, digital and electronic science resources.	3.00	9	HA	3.00	8.5	HA	3.00	10	HA
4. The library maintain a relevant and updated collection.	3.00	9	HA	3.00	8.5	HA	3.00	10	HA
AVERAGE	**3.25**		**EA**	**3.00**		**HA**	**3.13**		**HA**
B. Services and Utilization									
1. The library provides the following:									
A. On- Line Public Access (OPAC)	2.00	15	A	5.00	1.5	EA	3.50	4	EA
B. Inventory reporting	3.00	9	HA	5.00	1.5	EA	4.00	1	EA
C. Internet searching	3.00	9	HA	4.00	3.0	EA	3.50	4	EA
D. Photocopying	2.00	15	A	3.00	8.5	HA	2.50	14.5	HA
2. The librarians and staff are available during library hours to assist and provide library services.	4.00	3	EA	2.00	14.5	A	3.00	10	HA
AVERAGE	**2.80**		**HA**	**3.80**		**EA**	**3.30**		**HA**
C. Physical Set- Up and Facilities									
1. The library is strategically located and accessible to students, faculty and other clientele.	4.00	3	EA	3.00	8.5	HA	3.50	4	EA
2. The size of the library meets standard requirements considering the present enrollment and future expansion.	3.00	9	HA	3.00	8.5	HA	3.00	10	HA
3. The reading room can accommodate at least 10% of the school enrollment at any given time.	3.00	9	HA	2.00	14.5	A	2.50	14.5	HA
4. The library is well lighted.	3.00	9	HA	3.00	8.5	HA	3.00	10	HA
5. The library is well ventilated.	3.00	9	HA	3.00	8.5	HA	3.00	10	HA
6. The atmosphere is conducive to learning.	4.00	3	EA	3.00	8.5	HA	3.50	4	EA
AVERAGE	**3.33**		**HA**	**2.83**		**HA**	**3.08**		**HA**
AVERAGE	**3.13**		**HA**	**3.20**		**HA**	**3.17**		**HA**

Table N6

Administration

Administration	PISQ			PSD			Overall		
	M	**RANK**	**VI**	***M***	**RANK**	**VI**	***M***	**RANK**	**VI**
A. Academic Administration									
1. The administrators have appropriate/ relevant educational qualification and experience.	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
2. The administrators implement a supervisory program.	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
3. The administrators and the faculty work together for the improvement of the Science area, particularly in:									
A. Setting standards and targets	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
B. Planning of programs and other related activities	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
C. Implementing, monitoring and evaluation of plans, programs and other related activities	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
D. Providing opportunities for professional growth and development for the faculty	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
E. Preparing guidelines on the proper use and maintenance of facilities, apparatuses, tools and materials, etc.	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
AVERAGE	**4.00**		**EA**	**4.00**		**EA**	4.00		EA
B. Student Administration									
1. Students are provided opportunities to participate in the planning and implementation of science activities.	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
2. Concerned officials, faculty and staff act promptly on request, needs and problems of the students.	4.00	10.5	EA	3.00	17.5	HA	3.50	17.5	EA
3. The administration, faculty, staff and students work harmoniously and maintain good relationship.	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
AVERAGE	**4.00**		**EA**	**3.67**		**EA**	3.84		EA
C. Financial Management									
1. The school allocates funds for the following Science related activities and services:									
A. Improvement of laboratory	4.00	10.5	EA	3.00	17.5	HA	3.50	17.5	EA
B. Repair and maintenance of facilities and equipment	4.00	10.5	EA	3.00	17.5	HA	3.50	17.5	EA
C. Purchase of new equipment, supplies and materials	4.00	10.5	EA	3.00	17.5	HA	3.50	17.5	EA
D. Participation in competitions and campaigns	4.00	10.5	EA	3.00	17.5	HA	3.50	17.5	EA

E. Partnership with organization/ club	4.00	10.5	EA	3.00	17.5	HA	3.50	17.5	EA
2. The administrative officials, staff, faculty and student representatives participate in the budget preparation and procurement of science apparatuses, tools and materials.	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
AVERAGE	**4.00**		**EA**	**3.17**		**HA**	3.59		EA
D. Faculty Administration									
1. Regular classroom observation/ supervision	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
2. Regular faculty performance evaluation	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
3. Attendance/ participation of faculty in science related trainings and seminars	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
4. Encouragement of faculty members to produce their own instructional materials such as modules, visual aids, manuals and textbooks.	4.00	10.5	EA	4.00	7.5	EA	4.00	7.5	EA
AVERAGE	**4.00**		**EA**	**4.00**		**EA**	4.00		EA
AVERAGE	**4.00**		**EA**	**3.70**		**EA**	3.85		EA

Appendix O

AUTHENTICITY RESULT

Philippine Normal University
College of Graduate Studies and Teacher Education Research
PUBLICATION OFFICE

AUTHENTICITY RESULT

Date of Release:	April 22, 2016
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Author(s):	Mary Glorace Jacob

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