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Self-Regulation as Correlates to Students' Anxierty and Achievement in Chemistry

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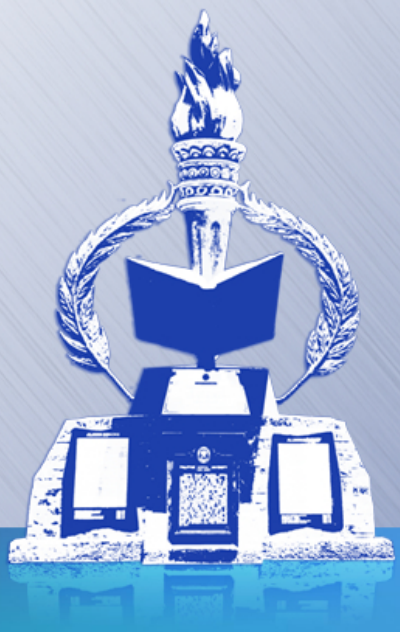

SELF - REGULATION AS CORRELATES TO STUDENTS' TEST ANXIETYAND ACHIEVEMENT IN CHEMISTRY

A Seminar Paper
Presented to the College of Graduate Studies
and Teacher Education Research

In Partial Fulfillment of the Requirements for the Degree
Master of Education
with Specialization in Chemistry

by

AILEEN BELLE K. FRANCISCO

October 2014

APPROVAL SHEET

This seminar paper entitled **"SELF-REGULATION AS CORRELATES TO STUDENTS' TEST ANXIETY AND ACHIEVEMENT IN CHEMISTRY,"** prepared and submitted by **AILEEN BELLE K. FRANCISCO**in partial fulfillment of the requirements for the degree of **Master of Education with Specialization in Chemistry**, is hereby recommended for approval and acceptance.

_____ _____

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ABKF

Abstract

Researcher: Aileen Belle K. Francisco

Title: Self-regulation as Correlates to Students' Test Anxiety and Achievement in Chemistry

Key Concepts: self – regulation, test anxiety achievement in chemistry

Degree: Master of Education with Specialization in Chemistry

Adviser: Allen A. Espinosa, M.A. Ed.

The study determined if self-regulation is related to students' test anxiety and achievement in chemistry. The study utilized the prediction correlational research, designed to examine how self-regulation, the predictor variable, will affect students' test anxiety and achievement in chemistry. A total of thirty seven (37) students from the science section participated in the study. It was composed of twenty one (21) male and sixteen (16) female of fourth year students from a state school in Las Piñas, during the first quarter of school year (SY) 2014 - 2015. The scope of the study was focused only on the relationship of self-regulated learning (SRL) to test anxiety and achievement in chemistry. Instruments used in the study were: (1) Self-Regulation Questionnaire (SRQ) for measuring students' attitude towards science; (2) Achievement Test for assessing students' achievement and; (3) Test Anxiety Questionnaire (TAQ) for evaluating students' level of anxiety. The instruments were all content validated by panel of experts and were pilot tested. The results suggested that higher achievement in science and self-regulation towards chemistry are all insignificantly correlated to test anxiety. Given that students were prepared for the examination, they were able to conquer their test anxiety; therefore, it did not affect higher achievement in science. Self-regulation towards science was

also unrelated to test anxiety. One's attitude towards the discipline is predicted by factors other than a single stimulus.

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The Self-Regulation Questionnaire (SRQ)

Self-regulation is the ability to develop, implement, and flexibly maintain planned behavior in order to achieve one's goals. Building on the foundational work of Frederick Kanfer (Kanfer, 1970a, 1970b), Miller and Brown formulated a seven-step model of self-regulation (Brown, 1998) (Miller & Brown, 1991). In this model, behavioral self-regulation may falter because of failure or deficits at any of these seven steps:

1. **Receiving** relevant information
2. **Evaluating** the information and comparing it to norms
3. **Triggering** change
4. **Searching** for options
5. **Formulating** a plan
6. **Implementing** the plan
7. **Assessing** the plan's effectiveness (which recycles to steps 1 and 2)

Although this model was developed specifically to study addictive behaviors, the self-regulatory processes it describes are meant to be general principles of behavioral self-control.

The Self-Regulation Questionnaire (SRQ; (Brown, Miller, & Lawendowski, 1999) was developed as a first attempt to assess these self-regulatory processes through self-report. We did not know whether people could reliably and accurately report their own self-regulatory capabilities. Items were developed to mark each of the seven sub–processes of the Miller and Brown (1991) model, forming seven rationally-derived subscales of the SRQ. Subsequent analyses of the instrument have suggested that the scale contains one principal component, rather than specific factors corresponding to the rational subscales. If this is confirmed in further studies, the SRQ could be reduced to a short form that would reliably measure the underlying principal component.

Reliability

Reliability of the SRQ appears to be excellent. In a community sample of 83 people with varying levels of alcohol problem severity, the SRQ was administered twice, separated by 48 hours, to test stability of scores it provides (Aubrey, Brown, & Miller, 1994). Test-retest reliability for the total SRQ score was high ($r = .94$, $p < .0001$). Internal consistency of the scale was also quite high ($\alpha = .91$), consistent with the idea that its items contain much redundancy.

Content Validity

The SRQ also has shown strong convergent validity with concomitant measures. In our community sample (Aubrey et al., 1994), SRQ score was significantly and inversely correlated with volume of alcohol consumption per occasion ($r = -.23$, $p = .04$) and with negative consequences of drinking ($r = -.46$, $p < .0001$). That is, people with lower scores on the SRQ were more likely to be heavy and problem drinkers. The SRQ also significantly discriminated

individuals meeting diagnostic criteria for alcohol dependence (N = 32; lowest scores) from heavy drinkers not seeking treatment (N = 29; intermediate scores) and people without alcohol problems (N = 22; highest SRQ scores).

In a clinical study with alcohol-dependent inpatients (Brown, 1994), individuals with lower SRQ scores showed more evidence of frontal impairment on neuropsychological measures, more alcohol-related consequences, fewer abstinent days, and a higher percentage of heavy drinking days.

In a sample of 300 college students (Brown, Baumann, Smith, & Etheridge, 1997), lower SRQ scores were associated with binge drinking, more alcohol-related consequences, and more frequent marijuana use. In a subsequent study of 303 college students, SRQ scores were inversely related to risk-taking (r = -.244, $p < .001$) and impulsivity (r = -.469, $p < .001$) as well as binge drinking, driving after drinking, marijuana use and tobacco smoking.

Recommended Use

At its present stage of development, we do not recommend using the SRQ for clinical decision-making. There is good support for interpreting the total SRQ score (across all 63 items) as a reflection of self-regulatory functioning. Based on our clinical and college samples, we tentatively recommend the following ranges for interpreting SRQ total scores:

≥239	High (intact) self-regulation capacity
214-238	Intermediate (moderate) self-regulation capacity
≤ 213	Low (impaired) self-regulation capacity

The seven subscales are for research purposes only. We do not recommend separate interpretation of the subscale scores at this stage of instrument development.

Scoring

All 63 items are answered on a 5-point Likert scale with the following scale points:

1	Strongly disagree
2	Disagree
3	Uncertain or Unsure
4	Agree
5	Strongly Agree

Table 1 presents the 63 items, the subscales to which they were logically assigned, and the items that are to be reverse-scaled (R). For reverse-scaled items, 1=5, 2=4, 3=3. 4=2, and 5=1.

Table 1

Items of the Self-Regulation Questionnaire

Item	Subscale	R
1. I usually keep track of my progress toward my goals.	Receiving	
2. My behavior is not that different from other people's.	Evaluating	R
3. Others tell me that I keep on with things too long.	Triggering	R
4. I doubt I could change even if I wanted to.	Searching	R
5. I have trouble making up my mind about things.	Planning	R
6. I get easily distracted from my plans.	Implementing	R
7. I reward myself for progress toward my goals.	Assessing	
8. I don't notice the effects of my actions until it's too late.	Receiving	R
9. My behavior is similar to that of my friends.	Evaluating	
10. It's hard for me to see anything helpful about changing my ways.	Triggering	R
11. I am able to accomplish goals I set for myself.	Searching	
12. I put off making decisions.	Planning	R
13. I have so many plans that it's hard for me to focus on any one of them.	Implementing	R
14. I change the way I do things when I see a problem with how things are going.	Assessing	
15. It's hard for me to notice when I've “had enough” (alcohol, food, sweets).	Receiving	R
16. I think a lot about what other people think of me.	Evaluating	
17. I am willing to consider other ways of doing things.	Triggering	
18. If I wanted to change, I am confident that I could do it.	Searching	
19. When it comes to deciding about a change, I feel overwhelmed by the choices.	Planning	R
20. I have trouble following through with things once I've made up my mind to do something.	Implementing	R

21. I don't seem to learn from my mistakes.	Assessing	R
22. I'm usually careful not to overdo it when working, eating, drinking.	Receiving	
23. I tend to compare myself with other people.	Evaluating	
24. I enjoy a routine, and like things to stay the same.	Triggering	R
25. I have sought out advice or information about changing.	Searching	
26. I can come up with lots of ways to change, but it's hard for me to decide which one to use.	Planning	R
27. I can stick to a plan that's working well.	Implementing	
28. I usually only have to make a mistake one time in order to learn from it.	Assessing	
29. I don't learn well from punishment.	Receiving	R
30. I have personal standards, and try to live up to them.	Evaluating	
31. I am set in my ways.	Triggering	R
32. As soon as I see a problem or challenge, I start looking for possible solutions.	Searching	
33. I have a hard time setting goals for myself.	Planning	R
34. I have a lot of willpower.	Implementing	
35. When I'm trying to change something, I pay a lot of attention to how I'm doing.	Assessing	
36. I usually judge what I'm doing by the consequences of my actions.	Receiving	
37. I don't care if I'm different from most people.	Evaluating	R
38. As soon as I see things aren't going right I want to do something about it.	Triggering	
39. There is usually more than one way to accomplish something.	Searching	
40. I have trouble making plans to help me reach my goals.	Planning	R
41. I am able to resist temptation.	Implementing	
42. I set goals for myself and keep track of my progress.	Assessing	
43. Most of the time I don't pay attention to what I'm doing.	Receiving	R

44. I try to be like people around me.	Evaluating	
45. I tend to keep doing the same thing, even when it doesn't work.	Triggering	R
46. I can usually find several different possibilities when I want to change something.	Searching	
47. Once I have a goal, I can usually plan how to reach it.	Planning	
48. I have rules that I stick by no matter what.	Implementing	
49. If I make a resolution to change something, I pay a lot of attention to how I'm doing.	Assessing	
50. Often I don't notice what I'm doing until someone calls it to my attention.	Receiving	R
51. I think a lot about how I'm doing.	Evaluating	
52. Usually I see the need to change before others do.	Triggering	
53. I'm good at finding different ways to get what I want.	Searching	
54. I usually think before I act.	Planning	
55. Little problems or distractions throw me off course.	Implementing	R
56. I feel bad when I don't meet my goals.	Assessing	
57. I learn from my mistakes.	Receiving	
58. I know how I want to be.	Evaluating	
59. It bothers me when things aren't the way I want them.	Triggering	
60. I call in others for help when I need it.	Searching	
61. Before making a decision, I consider what is likely to happen if I do one thing or another.	Planning	
62. I give up quickly.	Implementing	R
63. I usually decide to change and hope for the best.	Assessing	R

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SRQ

Please answer the following questions by circling the response that best describes how you are. If you STRONGLY DISAGREE with a statement, circle ①. If you DISAGREE circle ②. If you are UNCERTAIN or UNSURE circle ③. If you AGREE circle ④, and if you STRONGLY AGREE circle ⑤. There are no right or wrong answers. Work quickly and don't think too long about your answers.

	Strongly Disagree	Disagree	Uncertain Or Unsure	Agree	Strongly Agree
1. I usually keep track of my progress toward my goals.	1	2	3	4	5
2. My behavior is not that different from other people's.	1	2	3	4	5
3. Others tell me that I keep on with things too long.	1	2	3	4	5
4. I doubt I could change even if I wanted to.	1	2	3	4	5
5. I have trouble making up my mind about things.	1	2	3	4	5
6. I get easily distracted from my plans.	1	2	3	4	5
7. I reward myself for progress toward my goals.	1	2	3	4	5
8. I don't notice the effects of my actions until it's too late.	1	2	3	4	5
9. My behavior is similar to that of my friends.	1	2	3	4	5
10. It's hard for me to see anything helpful about changing my ways.	1	2	3	4	5
11. I am able to accomplish goals I set for myself.	1	2	3	4	5
12. I put off making decisions.	1	2	3	4	5
13. I have so many plans that it's hard for me to focus on any one of them.	1	2	3	4	5
14. I change the way I do things when I see a problem with how things are going.	1	2	3	4	5
15. It's hard for me to notice when I've “had enough” (alcohol, food, sweets).	1	2	3	4	5
16. I think a lot about what other people think of me.	1	2	3	4	5
17. I am willing to consider other ways of doing things.	1	2	3	4	5
18. If I wanted to change, I am confident that I could do it.	1	2	3	4	5
19. When it comes to deciding about a change, I feel overwhelmed by the choices.	1	2	3	4	5
20. I have trouble following through with things once I've made up my mind to do something.	1	2	3	4	5

| | Strongly Disagree | Disagree | Uncertain Or Unsure | Agree | Strongly Agree |

	Strongly Disagree	Disagree	Uncertain Or Unsure	Agree	Strongly Agree
21. I don't seem to learn from my mistakes.	1	2	3	4	5
22. I'm usually careful not to overdo it when working, eating, drinking.	1	2	3	4	5
23. I tend to compare myself with other people.	1	2	3	4	5
24. I enjoy a routine, and like things to stay the same.	1	2	3	4	5
25. I have sought out advice or information about changing.	1	2	3	4	5
26. I can come up with lots of ways to change, but it's hard for me to decide which one to use.	1	2	3	4	5
27. I can stick to a plan that's working well.	1	2	3	4	5
28. I usually only have to make a mistake one time in order to learn from it.	1	2	3	4	5
29. I don't learn well from punishment.	1	2	3	4	5
30. I have personal standards, and try to live up to them.	1	2	3	4	5
31. I am set in my ways.	1	2	3	4	5
32. As soon as I see a problem or challenge, I start looking for possible solutions.	1	2	3	4	5
33. I have a hard time setting goals for myself.	1	2	3	4	5
34. I have a lot of willpower.	1	2	3	4	5
35. When I'm trying to change something, I pay a lot of attention to how I'm doing.	1	2	3	4	5
36. I usually judge what I'm doing by the consequences of my actions.	1	2	3	4	5
37. I don't care if I'm different from most people.	1	2	3	4	5
38. As soon as I see things aren't going right I want to do something about it.	1	2	3	4	5
39. There is usually more than one way to accomplish something.	1	2	3	4	5
40. I have trouble making plans to help me reach my goals.	1	2	3	4	5
41. I am able to resist temptation.	1	2	3	4	5
42. I set goals for myself and keep track of my progress.	1	2	3	4	5
43. Most of the time I don't pay attention to what I'm doing.	1	2	3	4	5
44. I try to be like people around me.	1	2	3	4	5
	Strongly Disagree	Disagree	Uncertain Or Unsure	Agree	Strongly Agree

	Strongly Disagree	Disagree	Uncertain Or Unsure	Agree	Strongly Agree
45. I tend to keep doing the same thing, even when it doesn't work.	1	2	3	4	5
46. I can usually find several different possibilities when I want to change something.	1	2	3	4	5
47. Once I have a goal, I can usually plan how to reach it.	1	2	3	4	5
48. I have rules that I stick by no matter what.	1	2	3	4	5
49. If I make a resolution to change something, I pay a lot of attention to how I'm doing.	1	2	3	4	5
50. Often I don't notice what I'm doing until someone calls it to my attention.	1	2	3	4	5
51. I think a lot about how I'm doing.	1	2	3	4	5
52. Usually I see the need to change before others do.	1	2	3	4	5
53. I'm good at finding different ways to get what I want.	1	2	3	4	5
54. I usually think before I act.	1	2	3	4	5
55. Little problems or distractions throw me off course.	1	2	3	4	5
56. I feel bad when I don't meet my goals.	1	2	3	4	5
57. I learn from my mistakes.	1	2	3	4	5
58. I know how I want to be.	1	2	3	4	5
59. It bothers me when things aren't the way I want them.	1	2	3	4	5
60. I call in others for help when I need it.	1	2	3	4	5
61. Before making a decision, I consider what is likely to happen if I do one thing or another.	1	2	3	4	5
62. I give up quickly.	1	2	3	4	5
63. I usually decide to change and hope for the best.	1	2	3	4	5

	Strongly Disagree	Disagree	Uncertain Or Unsure	Agree	Strongly Agree

TEST ANXIETY QUESTIONNAIRE

The items in the questionnaire refer to experiences that may cause fear or apprehension. For each item, place a check in the box under the column that describes how much you are frightened by it. Work quickly, but be sure to consider each item individually. For each box you check, write down the corresponding number of points:

Not At All = 1; A Little = 2; A Fair Amount = 3; Much = 4; Very Much = 5.

SITUATION	NOT AT ALL	A LITTLE	A FAIR AMOUNT	MUCH	VERY MUCH
1. Going into a regularly scheduled class period in which the professor asks the students to participate.					
2. Re-reading the answers I gave on the test before turning it in.					
3. Sitting down to study before a regularly scheduled class.					
4. Turning my completed test paper in.					
5. Hearing the announcement of a coming test.					
6. Having a test returned.					
7. Reading the first question on a final exam.					
8. Studying for a class in which I am scared of the professor.					
9. Being in class waiting for my corrected test to be returned.					
10. Seeing a test question and not being sure of the answer.					
11. Studying for a test the night before.					
12. Waiting to enter the room where a test is to be given.					
13. Waiting for a test to be handed out.					
14. Being called on to answer a question in class by a professor who scares me.					

SITUATION	NOT AT ALL	A LITTLE	A FAIR AMOUNT	MUCH	VERY MUCH
15. Waiting for the day my corrected test will be returned.					
16. Seeing my standing on the exam relative to other people's standing.					
17. Discussing with the professor an answer I believed to be right, but that was marked wrong.					
18. Waiting to see my letter grade on the test.					
19. Studying for a quiz.					
20. Studying for a midterm.					
21. Studying for a final.					
22. Discussing my approaching test with friends a few weeks before the test.					
23. After the test, listening to the answers which my friends selected.					
24. Looking at the clock to see how much time remains during the exam.					
25. Seeing the number of questions that need to be answered on the test.					
26. On an essay exam, seeing a question I cannot answer.					
27. On a multiple choice test, seeing a question I cannot answer.					
28. Being asked by someone if I am ready for a forthcoming exam.					
29. Being the first one to finish an exam and turn it in.					
30. Being asked by a friend where I stand in a class.					

SITUATION	NOT AT ALL	A LITTLE	A FAIR AMOUNT	MUCH	VERY MUCH
31. Being asked by a friend the results of a test on which I did poorly.					
32. Discovering I need an A or B on the next test in order to pass the course.					
33. Discovering I need an A or B on the final to maintain the grade point average necessary to remain in school.					
34. Remembering my past reactions while preparing for another test.					
35. Seeking out the teaching assistant or professor for advice or help.					
36. Being told to see the professor concerning some aspects of my class work.					
37. Asking for a make-up exam after missing the scheduled exam.					
38. Being the last one to finish an exam and turn it in.					
39. Discussing the course content with fellow students just before entering the classroom the day of the exam.					
40. Reviewing study materials the night before an exam.					
41. On the first day of the course hearing the professor announce the dates of the midterm and final exams.					
42. Having the professor ask a question of the class which deals with the course material and then look in my direction.					
43. Making an appointment to see the professor regarding some course problem.					
44. Thinking about a coming exam *3 weeks before* it's scheduled.					
45. Thinking about a coming exam *1 week before* it's scheduled.					

	NOT AT ALL	A LITTLE	A FAIR AMOUNT	MUCH	VERY MUCH
46. Thinking about a coming exam *the weekend* before it's scheduled.					
47. Thinking about a coming exam *the night before* it's scheduled.					
48. Thinking about a coming exam *the hour before* it's scheduled.					
TOTALS FOR EACH COLUMN					

TOTAL SCORE

To analyze your Test Anxiety Questionnaire, add up the totals from each column. A score of 160 or higher indicates that you may have a problem with test anxiety. Please be assured that these symptoms of anxiety in testing situations are not abnormal or strange. They are the types of things people normally experience when they are under stress that is difficult to handle, or when they are very anxious. As you have probably noticed, the feelings usually pass away quickly, including the irrational thoughts, when the test is over and the situation changes. Also, it is quite possible to learn to control anxiety of this kind--when you know how to go about it. Consult a SLAC counselor, the books about anxiety management in the SLAC Lab, or the University Counseling Center for tips on test anxiety reduction.

Source: Suinn, R.M. (1969). The STABS, a measure of test anxiety for behavior therapy: Normative data*. *Behavior Research and Therapy*, 7, 335-339.
Revised: Summer 2002
STUDENT LEARNING ASSISTANCE CENTER (SLAC)
Texas State University-San Marcos

APPENDIX C

Consumer Chemistry Syllabus

Las Piñas National High School
CONSUMER CHEMISTRY
SYLLABUS FOR SCHOOL YEAR 2014-2015

Course Description:

CONSUMER CHEMISTRY is the chemistry of everyday processes and products. It is an integrated Chemistry course. Knowledge of Basic Chemistry concepts and chemical principles are very important in this subject. Lecture, discussions, experiments and other hands on activities are done in the chemistry laboratory. This course involved the : chemistry of soaps and detergents, foods, cosmetics, deodorants, toothpastes, toys , paints and plastics and other products commonly found in the kitchen, laundry, bathroom, bedroom, and workshop.. This course satisfies one school year of a general education and laboratory science requirement.

Course Objectives:

Given the necessary materials, and upon completion of the course, the students will be able to do the following:

1. Classify all samples of matter as an element, compound or mixture.

2. Describe the arrangement of the basic subatomic particles within the atom which lead to differences in mass, stability and reactivity of the elements along with their positioning on the periodic table of elements.

3. Differentiate between organic and organic compounds.

4. Classify organic compounds

5. Describe the composition of a material from its chemical name or label ingredients.

6. Classify certain substances as acids, bases, and salts, and identify these compounds among commonly encountered household materials, and relate each to the pH scale.

7. Identify structures, simple naming, and applications of organic compounds in household products.

8. Distinguish and read label information on a wide range of consumer products and be able to find information on any "unknown" ingredient.

9. Discuss the development process involved with bringing a consumer product to the marketplace.

10. Describe environmental aspects of consumer products in the local, state, regional, national and international realms.

11. Discuss current problems and potential problems of consumer products and additives.

12. Describe current and alternative energy sources and resources.

13. Discuss common medicinal plants and prepare homeopathic medicine.

Course Outline

The following outline presents topics, activities, and experiments in the order they will be discussed and/or performed in class. Although each topic is listed by specific date, there may be some changes due to extended class discussions or activities/experiments. Applicable readings or links to reading material is available on the course web site. Read or view any referenced information before the material is discussed in class. Class discussions will be based on this material. Problem assignments or calculations will be covered in context with activities and/or laboratory experiments.

Date	Topic	Reading Assignment	Lab Experiment and/or Activities
June 2-6, 2014	A. Orientation of the subject (Review on syllabus and course	Discovery of Elements	No lab activities Quiz 1

	requirements) B. What is an atom? • Origin of elements (History) • Elements vs. Compounds		
June 9-13 June 16-20,2013	C. Elements • The periodic table of elements • Arrangement of elements in the periodic table • Activity 1:Laboratory orientation: check-in and lab safety	View: Forging the Elements from NOVA http://www.pbs.org/wgbh/nova/origins/program-3114.html	Quiz 2 Laboratory Orientation Check-in Lab safety
June 23-27	D. Properties of some common chemicals • Physical and chemical properties • Economics of chemical products		• Activity 2 : Economics of chemical products • Quiz 3
June 30 to	E. Reading Labels and names of chemicals Elements and symbol Drill		• Practice on label Readings
July 04, 2014	F. Acids, Bases, and pH • Lab activity: Acids, Bases, and pH using red	Review week	• Acids, Bases, and pH using red cabbage

	cabbage Paper indicator		• paper indicator (Class activity • Quiz 4
July 07-18, 2014 (two weeks)	G. Introduction to organic chemistry • Carbon • Petroleum H. Structure and Nomenclature of I. Hydrocarbons J. Functional group compounds	Nomenclature of organic compounds (on website)	• Fossil fuels/Petroleum (video showing) • Long Test 1
July 21-25,2014	A. K. Chemistry in the Laundry B. • Whiter and brighter: soaps and detergents C. • Other household cleaning agents D. • Dry cleaning E. -Where does it go when it goes down the drain?	Soap and detergent (Reading /researching over the internet)	Quiz no.5 No lab activity Video presentation of dry cleaning.
July 28- Aug 1,2014	F. PROJECT MAKING WEEK Detergent and Fabric Conditioner Making		1. Preparation of detergent 2. Preparation of fabric conditioner •Evaluation of cleaning effectiveness of powdered detergents
August 4-8,2014	EXAMINATION WEEK / FIRST QUARTER		
August 11-15,2014	A. Chemistry of surfaces Solutions Emulsions		Drops on a coin (Class activity) Quiz 1

	Foams		
August 18-22,2014	B. Chemistry in the kitchen Nutrients Starch Fats and oils		Potato Chip Tasting (class activity) Testing for Starch (class activity) Quiz 2
August 25-29,2014	C. Chemistry of Cooking 1.Fermentation **PROJECT MAKING 1** -Pickles - food preservation -Salting		Atchara making Egg salting
September 1-5,2014	2. popcorn cooking	The Chemistry of Cooking Popcorn	Why does popcorn puff? (class activity) Popcorn cooking and Selling Long Test 1
September 8-12,2014	3. Chemistry in the dining room Foods and food additives	Food Chemistry articles	• Apple browning: a look at antioxidants (Class activity) Quiz 3
September 22-26,2014	**PROJECT MAKING 2**	The Goodness of Fresh Milk	Making Pastillas de Leche from Fresh Cow's Milk
September29-October 3,2014	4. Flour and bread Legal highs: Foods as drugs		Determining the Caloric Content of

	Vitamins and minerals		Selected Foods (class Activity) How Yeast Works (class Activity) Quiz 4
October 6-10,2014	5. Water The water cycle Water treatment Wastewater treatment		Testing the Waters: How Good is that bottled Water and how effective is water filter? (Class Activity)
October 13-15,2014	Review Sessions		Long Test 2
October 16-17	SECOND QUARTERLY TEST		
OCTOBER 20-24,2013	SEMESTRAL BREAK		
October 27-31,2014	A. Cosmetics and Personal Care Products Perfumes Tanning and sunscreens	Cosmetics and personal care articles	• Toothpaste testing (class activity) • Preparation of a Skin Cream Quiz 1
November 3-14,2014 (2 weeks)	B. Chemistry in the medicine cabinet Aches, pains, and pills Over the counter medications Homeophatic medicine	Medicines and drugs article	Reading medicine labels (class Activity) Compiling medicine labels for Different types of dieseases. Long Test 1
November 17-21,2014	PROJECT MAKING WEEK Preparation of Herbal Medicine		Preparation of herbal medicine Group presentation of finish products

November 24-28,2014	Dyes • Types of dyes • Plant dyes • Uses of dyes		Group reporting on uses of dyes and its importance to different fields of specialization.
December 1-5,2014	Tie-dyeing PROJECT MAKING 2		Tie dyeing Activity Long test 2
December 8-12,2014	Project Exhibit Culminating Activity		All group projects from 1st -3rd quarter will be on sale. (e.g. fabric conditioner, detergent powder, preserved foods, t-shirt,)
December 15-19,2014	Christmas Activities		
December 20,2014	Start of Christmas Break		
January 05 January 6-7,2015 January 8-9,2015	Resumption of Classes Review sessions 3rd QUARTERLY EXAMINATION		
January 13-24,2015 (2 weeks)	A. Chemistry of hardware and software (Plastics and polymers) Types of Polymers plastics, polymers, and toys Polymers Glass	Household Articles	Group reporting on types of polyymers. Video presentation on polymers Quiz 1
January 27-febraury 7, 2015	B. Metals		Special report on Nitinol: a metal with

(2weeks)	Polishng your metals Properties of iron		memory Quiz 2
February 10-14,2015	C. Fibers and fabrics • Carpets • Leather	Long Test 1	Long test 1
	Paper and its Uses		• Research week on materials to use for papermaking activity • Project proposal and Gathering of materials
February 17-March 7,2015	PROJECT MAKING Paper Making		Paper Making Activity Oral Defense
	D. Paints and artist materials		Activity: making wax crayons
March 10-14,2015	E. Adhesives		Paper Testing : (artwork)finish paper products will be tested using paints and crayons. Quiz 3
March 17-21,2015	Paper exhibit Review sessions		Long Test 2

	Final week		
March 23-24,2015	4th Quarterly Examination		

APPENDIX D

Achievement Test in Consumer Chemistry

Direction: Read the following questions carefully and select the best answer.

1. Which of the elements given below is used in electrical wirings because it is a good conductor of electricity?
   A. Carbon B. Chlorine C. Copper D. Fluorine

2. How will you distinguish between an acid and base?
   A. Compare their density C. Compare their melting point
   B. Test with litmus paper D. Test for Tyndall effect
3. Which substance is dense, shiny, and malleable?
   A. Gold B. Arsenic C. Charcoal D. Boron
4. Which mixture is NOT homogeneous?
   A. Boiled rice washing B. Alum and alcohol C. Vinegar D. Chocolate drink

5. Which of the following is an element?
   A. Salt B. Sugar C. Sulfur D. Sodium bicarbonate
6. Metals are good conductors of heat and electricity. Which of the following element does NOT exhibit these properties?
   A. Chromium B. Tungsten C. Aluminum D. Sulfur
7. How do you classify milk of magnesia that has a pH of 10.5?
   A. Acidic substance B. Basic substance C. Neutral substance D. None of these
8. A violet, solid material was heated. A gas was released and a white crystalline solid was produced. How do we classify the original substance?
   A. Element B. Metal C. Compound D. Nonmetal
9. How does an element differ from a compound?
   A. An element is made up of a single kind of atom.
   B. An element is a homogeneous mixture of two or more atoms.
   C. An element contains a definite proportion of atoms.
   D. An element can be separated into its components by chemical means.
10. Which pure substance is an element?
    A. CO B. N_2 C. NaCl D. CH_4
11. Table sugar, $C_{12}H_{22}O_{11}$ contains three different elements. Which element below is NOT a component of sugar?
    A. Calcium B. Carbon C. Hydrogen D. Oxygen
12. What is represented by the formula, C_2H_5OH?
    A. Ethanol B. Carbonic acid C. Sugar D. Water
13. Sudden death during fasting, poor nerve function,and irregular heart beat are the effects when someone has a deficiency condition. What element maintains this on our body?
    A. Ca B. Mg C. K D. P
14. Which change in the litmus paper indicates basic solution?
    A. Blue to red B. Red to blue C. Purple to yellow D. Red to yellow
15. Which characteristic below does NOT describe an acid?
    A. It has a slippery feel. C. It conducts electricity.
    B. It reacts with metals. D. It donates H^+ ion in aqueous solution.
16. Which material is basic in nature based on the plant indicator test?
    A. Baking powder B. Calamansi juice C. Milk D. Soft Drink
17. Which element is common to most acids?
    A. Chlorine B. Hydrogen C. Nitrogen D. Oxygen
18. Fruit juice, soft drink, and intimate wash like *Lactacyd* contain which kind of compound?
    A. Weak acid B. Weak base C. Strong acid D. Strong base

19. How does our body cope with the changes in pH level?
    A. Breathing is slowed down to increase the pH in the blood.
    B. People hyperventilate to decrease the pH level in the blood.
    C. When the pH in the body is too basic, breathing is slowed to lower the pH of the blood.
    D. When our blood has too much CO_2, we breathe in hard to increase the air that moves into the blood.
20. Which statement is TRUE about pH?
    A. pH of less than 7 is basic; pH of more than 7 is acidic.
    B. pH of less than 7 is acidic; pH of more than 7 is basic.
    C. An increasing pH level means that the mixture is more acidic.
    D. A decreasing pH level means that the mixture becomes more basic.
21. Why do metals tarnish such as those statues made up of copper?
    A. Metals react with base in the air.
    B. Metals react with acid in the air.
    C. Metals naturally decay to sunlight.
    D. Metals conduct electricity such as lightning.
22. Liquid Sosa or caustic soda is used to unclog drains. How does it work?
    A. It increases the flow of water in the drain.
    B. It causes the expansion of the hollow part of the drain.
    C. It dissolves materials which cause the clogging in the drain.
    D. It prevents microbes from occupying the hollow part of the drain.
23. What is the usual product when an acid neutralizes a base?
    A. Salt and water
    B. Strong acid and weak base
    C. Weak acid and strong base
    D. Hydronium and hydroxide ions
24. How is a metal different from a nonmetal?
    A. Metals are generally solid, dull and often opaque light.
    B. Metals are generally hard, lustrous, ductile and opaque light.
    C. Metals are malleable, less dense and generally good conductors.
    D. Metals are usually transparent and are generally hard and dense.
25. What property of metal refers to its ability to allow the flow of electric current?
    A. Conductivity B. Ductility C. Malleability D. Luster
26. Which element is the most abundant on the Earth's crust?
    A. Chlorine B. Helium C. Oxygen D. Silicon
27. Why are nonmetals used as insulators?
    A. Nonmetals are shiny and are used to reflect electricity.
    B. Nonmetals are poor conductors of electricity; thus they can be used to enclose electric current.
    C. Nonmetals cannot be drawn into fine wires; thus they can only be used to wrap electrical wires.
    D. Nonmetals are generally transparent. Electricity generally passes through them, so energy is lost.
28. When do metalloids become more metallic?
    A. Metalloids become more metallic when electricity passes through them.
    B. Metalloids become more metallic when they are used as computer chips.
    C. Metalloids become more metallic when they are heated or as temperature rises.
    D. Metalloids become more metallic when they are combined with metals such as iron and copper.
29. Which is NOT a metalloid?
    A. Arsenic B. Bromine C. Germanium D. Tellurium
30. Which of the following functional groups is characterized by the formula R-OH?
    A. Carboxylic acid B.Amine C. Alcohol D. Amide
31. Which of the following functional groups is characterized by the formula R-O-R?
    A. Ketone B. Ester C. Amine D. Ether
32. Which of the following does not belong to the group?
    A. Alkene B. Alcohol C. Alkane D. Alkyne
33. What is the maximum number of bond for carbon?
    A. 2 B. 3 C. 4 D. 5
34. Which part of soap dissolves in water?
    A. Sodium ion
    B. Potassium ion
    C. Negatively charged end of the hydrocarbon chain
    D. All of the above
35. What does the anion in soap usually contains?

A. Sodium or potassium ion C. Sulfate group
B. Carboxylate group D. Water molecule

36. Which statement about bases is INCORRECT?
A. They contain hydronium ions C. They turn litmus paper blue
B. They taste bitter D. All of the above

37. Which of the following tells the type of organic compound that a molecule represents?
A. Branch B. Prefix C. No. of single bonds D. Suffix

38. Carbohydrates, lipids and proteins all contain carbon, hydrogen and oxygen. Which one also contains nitrogen?
A. Carbohydrates B. Lipids C. Proteins D. Fats

39. What clear chemical might be found in drinking water that may be harmful to us?
A. Asbestos B. Carbon dioxide C. Lead D. NaCl

40. There are very small cracks in the wall. What possible hazard could be coming through the wall?
A. Benzene B. Thalates C. Radon D. Arsenic

41. Which element below is NOT a component of iodized salt?
A. Chlorine B. Iodine C. Magnesium D. Sodium

42. Tin is a major component of tin cans, hence the name what is the chemical symbol of tin?
A. Pb B. Sn C. Ti D. Tn

43. What represents a chemical compound?
A. Chemical equation C. Chemical reaction
B. Chemical formula D. Chemical symbol

44. When yellowsulfur is heated, it changes color. When white sugar is heated, it also changes color. However, when both materials are cooled, sulfur goes back to its original color while sugar doesn't not. What conclusion can you make between the two materials based on the experiment?
A. Sulfur is a pure substance while sugar is not.
B. Sulfur is an element while sugar is a compound.
C. Sulfur is not affected by oxygen in the air while oxygen reacts with sugar.
D. Sulfur consists of a single kind of atom while sugar consists of different atoms.

45. What is the tiny building block of matter?
A. Electron B. Molecule C. Proton D. Atom

46. According to a theory first proposed in the 1940s by British astronomer and mathematician Sir Fred Hoyle, "All the elements in the universe were forged within stars, EXCEPT _____."
A. C and H B. H and He C. C and He D. H and N

47. The scientist who construct the periodic table according to the similarities of elements.
A. Mendel B. Mendeleev C. Rutherford D. Bohr

48. What does the chemical composition of all petroleum principally made of?
A. Carbon B. Nitrogen C. Hydrogen D. Hydrocarbon

49. It is made up of a chain of hydrocarbons in which double bond exists between two carbon atoms and has a general formula of C_nH_{2n}.
A. Alkyne B. Alkene C. Alkane D. Alcohol

50. What is chemical symbol for gold?
A. Ag B. Au C. Gd D. Gl

APPENDIX E

Answer Key in Achievement Test

CONSUMER CHEMISTRY

1. C
2. B
3. A
4. A
5. C
6. D
7. B
8. C
9. A
10. B
11. A
12. A
13. C
14. B
15. A
16. A
17. B
18. A
19. D
20. B
21. B
22. C
23. A
24. C
25. A
26. C
27. B
28. C
29. B
30. C
31. D
32. B
33. C
34. D
35. B
36. A
37. D
38. C
39. C
40. C
41. C
42. B
43. B
44. C
45. D
46. B
47. B
48. D
49. B
50. B

APPENDIX E

Table of Specification

Las Piñas National High School
First Periodical Test in Consumer Chemistry
SY 2014-2015

TABLE OF SPECIFICATION

OBJECTIVE	**Behavioral Classification and item Placement**					**Total**
	Knowledge	**Comprehension**	**Analysis**	**Synthesis**	**Application**	
1. Classify all samples of matter as an element, compound or mixture.	5-6, 10, 26, 29, 42, 45, 50	4, 9 25, 43	28	8, 44	21, 27	17
2. Describe the arrangement of the basic subatomic particles within the atom which lead to differences in mass, stability and reactivity of the elements along with their positioning on the periodic table of elements.	3, 47	1, 46	13			5
3. Differentiate between organic and organic compounds.	12, 48	38				3
4. Classify organic compounds.	30-31, 37	32-33, 49				6
5. Describe the composition of a material from its chemical name or label ingredients.	11, 35, 41	34, 39	22, 40			7
6. Classify certain substances as acids, bases, and salts and identify these compounds among commonly encounteed materials and relate to the pH scale.	7, 16, 18	15, 17, 20, 23 36	2, 24		14, 19	12

Prepared and submitted by:

AILEEN BELLE FRANCISCO

APPENDIX F

Results of SRQ, TAQ, and Achievement in Chemistry

	GIRLS	SRQ	EXAM	TAQ
1	ABARSOZA, APRIL LOUISE L.	127	29	114
2	ALAG, JOYCE ANN V.	134	33	79
3	BONIFACIO, SHEEDAH D.	139	34	86
4	BUISING, JANELLA MAE Y.	145	32	99
5	BUTALON, PATRICIA JANE C.	145	28	145
6	CAINDOC, JULIIE ANN A.	145	38	153
7	DE LEON, JULIA ROSE G.	172	38	142
8	DELA CRUZ, RACHELLE ANNE C.	138	32	148
9	GATIL, CHARAISE ANNE M.	169	34	175
10	LACAP, LOREILLE ANN M.	149	34	123
11	LARA, MARIELLA P.	155	36	148
12	LEGASPI, ARIELLE JAMILA B.	171	34	100
13	NIRZA, NINA NICOLE P.	177	34	171
14	PECAÑA, MARINHESS O.	140	35	144
15	RONGAVILLA, PRINCESS D.	136	25	188
16	VILLANUEVA, RACHELL ANN .	147	35	144
	BOYS			
1	ARADO, PATRICK JASON A.	137	35	132
2	AYALA, SANDER ROY B.	124	37	137
3	BALIGUAT, NICHOLAS JAMES G.	154	38	148
4	BOMITIVO, RYAN A.	191	33	90
5	BUSA, ALVIN S.	164	28	142
6	CERDEÑA, CHRISTIAN PAUL E.	141	32	109
7	CORTES, CLARK JOHN R.	157	30	140
8	CULANNAY, KRISTOFFER G.	144	40	176
9	CUSTODIO, ALEXANDER B.	146	36	121
10	DIGNADICE, CARL DOMINIC G.	113	35	204
11	GERONA, LUCKY MIWRE M.	159	43	148
12	LACHICA, JOSEL B.	164	32	115
13	LANUZA, ELTON MARK P.	210	34	145
14	LEONARDO, KYLE WENDELL A.	161	35	159
15	NARVAEZ, ED FRANCIS B.	140	33	153
16	RELOSA, VICTOR RONALD G.	161	36	155
17	RIVERA, CHESTER KEITH A.	164	37	88
18	SALAMANES, SYRUS JAMES B.	166	36	120
19	SAMSON, CHRISTOPHER G.	169	36	110
20	SAPIANDANTE, ROY JASPER C.	136	37	105
21	ZETA, CHRISTIAN P.	163	38	102
	m	152.78	34.38	134.00
	sd	18.91	3.50	29.77

APPENDIX G

Reliability Test of Achievement in Chemistry

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.669	50

APPENDIX H

Correlation of SRQ and TAQ (SPSS)

Correlations

		SRQ	TEST ANXIETY
SRQ	Pearson Correlation	1	-.126
	Sig. (2-tailed)		.458
	N	37	37
TEST ANXIETY	Pearson Correlation	-.126	1
	Sig. (2-tailed)	.458	
	N	37	37

Correlations

			SRQ	TEST ANXIETY
Spearman's rho	SRQ	Correlation Coefficient	1.000	-.047
		Sig. (2-tailed)	.	.783
		N	37	37
	TEST ANXIETY	Correlation Coefficient	-.047	1.000
		Sig. (2-tailed)	.783	.
		N	37	37

APPENDIX I

Correlation of SRQ and Achievement (SPSS)

Correlations

		SRQ	Achievement
SRQ	Pearson Correlation	1	.115
	Sig. (2-tailed)		.498
	N	37	37
Achievement	Pearson Correlation	.115	1
	Sig. (2-tailed)	.498	
	N	37	37

Correlations

			SRQ	Achievement
Spearman's rho	SRQ	Correlation Coefficient	1.000	.126
		Sig. (2-tailed)	.	.458
		N	37	37
	Achievement	Correlation Coefficient	.126	1.000
		Sig. (2-tailed)	.458	.
		N	37	37

Chapter 1

The Problem and Its Setting

Background of the Study

Educators are increasingly emphasizing self-regulated learning as a means of raising students' achievement outcomes. Self-regulated learning (or self-regulation) refers to learning that results from students' self-generated thoughts and behaviors that are oriented systematically toward the attainment of their goals (Zimmerman, 2001). Researchers have identified several self-regulatory processes that students initiate, modify, and sustain. These includes attending to instruction, processing of information cognitively, rehearsing and relating new learning to prior learning, believing that one is capable of learning, and establishing productive work and social environments. Research shows that self-regulation and students' learning and achievement are positively correlated (Schunk, 1981).

Behavioral researchers Mace, Belfiore, & Hutchinson (2001) stressed self-regulating processes such as self-monitoring, self-instruction, self-evaluation, self-correction, and self-reinforcement.Many children begin school lacking self-regulation. This lack of self-regulation may have a great impact on how well they do in school and later in life. Self-regulation affects children's abilities to successfully function in school settings in two ways: first, *social-emotional* self-regulation makes it possible for children to conform to classroom rules and to benefit from learning in various social contexts, from one-on-one interactions to large groups;

and second, *cognitive* self-regulation allows children to use and further develop the cognitive processes necessary for academic learning and problem solving (Schunk and Zimmerman, 1998).

One assessment employed in chemistry is achievement test. Achievement test is used in both lecture and laboratory counterpart. According to Gronlund and Linn (1990), achievement test in lecture classes provide information for evaluating the course objectives and the effectiveness of the instruction used. Therefore, it is impossible to discard examinations or testing in any course just to dispel underachievement. Gronlund and Linn (1990) said that "testing can enhance student learning by assisting in determining learners' needs, in observing learning development, in identifying learning difficulties, and in determining if the desired degree of learning outcome is achieved" (p.12). Therefore, testing is an essential part of the science curriculum.

One of the factors affecting achievement in chemistry is test anxiety. According to Michele (2006), test anxiety is a "situation-specific personality trait that occurs before, during and after a testing session." Ogundokun (2011), said that it may also be defined as "the uneasiness, apprehension, or nervousness felt by students who have a fear of failing an exam." Moreover, according to Maehr and Midgley (1991), test anxiety may occur when the individual views the evaluative situation as being a personal threat that negatively affects academic performance by the evaluation practices of the classroom teacher. Test anxiety may also affect students' attitude towards chemistry. Yara (2009) mentioned that students' beliefs and attitudes have the potential to either facilitate or inhibit learning.

Test anxiety may also affect students' self-regulation towards chemistry. Academic achievement and positive attitude towards chemistry are important outcomes of science

education (Zimmerman, 2001). Students with high-cognitive test anxiety often report that they knew the information before the test, but when they entered the testing room, the information mysteriously escaped them. Empirical investigation of this ‘‘anxiety blockage phenomenon’’ has revealed that this pattern generally only occurs in situations where the student has high-test anxiety, good study skills, and the test items are easy (Covington &Omelich, 1987).

Casady (2010) suggest that between 25 to 40 percent of students experience test anxiety. Students with disabilities and students in gifted education classes tend to experience high rates of test anxiety. Students who experience test anxiety tend to be easily distracted during a test, experience difficulty with comprehending relatively simple instructions, and have trouble organizing or recalling relevant information (Zeidner, 1998).

Self-regulation is essential to the learning process (Jarvela&Jarvenoja, 2011; Zimmerman, 2008). It can help students create better learning habits and strengthen their study skills (Wolters, 2011), apply learning strategies to enhance academic outcomes (Harris, Friedlander, Sadler, Frizzelle, & Graham, 2005), monitor their performance (Harris et al., 2005), and evaluate their academic progress (De Bruin, Thiede& Camp, 2011). Thus, teachers should be familiar with the factors that influence a learner’s ability to self-regulate.They should also know the strategies they can use to identify and promote self-regulated learning (SRL) in their classrooms. In addition to self-regulation, motivation can have a pivotal impact on students’ academic outcomes (Zimmerman, 2008). Without motivation, SRL is much more difficult to achieve.

Self-regulated learners’ proactive qualities and self-motivating abilities help to distinguish them from their peers. Research shows that self-regulated students are more engaged

in their learning. These learners commonly seat themselves toward the front of the classroom (Labuhn, Zimmerman, &Hasselhorn, 2010), voluntarily offer answers to questions (Elstad&Turmo, 2010), and seek out additional resources when needed to master content (Clarebout, Horz, &Schnotz, 2010). Most importantly, self - regulated learners also manipulate their learning environments to meet their needs (Kolovelonis, Goudas, &Dermitzaki, 2011). For example, researchers have found that self-regulated learners are more likely to seek out advice (Clarebout et al., 2010) and information (De Bruin et al., 2011) and pursue positive learning climates (Labuhn et al., 2010), than their peers who display less self-regulation in the classroom. Due to their resourcefulness and engagement, it is not then surprising that findings from recent studies suggest that self-regulated learners also perform better on academic tests and measures of student performance and achievement (Schunk& Zimmerman, 2007; Zimmerman, 2008).

In a study of high school students, Labuhn et al. (2010) found that learners who were taught SRL skills through monitoring and imitation were more likely to elicit higher levels of academic self-efficacy (i.e., confidence) and perform higher on measures of academic achievement compared to students who did not receive SRL instruction. It seems as though SRL can make the difference between academic success and failure for many students (Graham & Harris, 2000; Kistner, Rakoczy, & Otto, 2010).

Zimmerman et al. (1990) specified three important characteristics of self-regulated learning :(1) self-observation, systematically monitoring own performance; keeping records is a big part of this. (2) self-judgment, systematically comparing performance with a standard or goal (e.g., re-examining answers; checking procedures; rating answers in relation to answer sheet, another person's) and (3) self-reaction—engage in personal processes (i.e., goal-setting;

metacognitive planning; behavioral outcomes); self-administering praise or criticism; rehearsing, memorizing; proximal goal-setting; structuring environment (e.g. change the academic task's difficulty; change the academic setting, the immediate physical environment; create a study area); asking for help.

This study correlated self-regulated learning to test anxiety and achievement in Chemistry. Zimmerman (2001) emphasized that self-regulated learning comes from students' own thoughts and behaviors which are inclined towards goal achievement. Those who are self-regulated learners initiate, modify, and sustain their attention towards instructions, cognition of information, comprehension of learning, and formation of insight. More so, they build and maintain their efficacy in learning to become more productive in their craft. Research made by Schunk (1981) had actually shown that self-regulation is positively correlated to achievement. Among the factors that inhibits achievement in learning is test anxiety. Science educators in Las Piñas National High School observed that higher test anxiety of fourth year Newton during first quarter of school year 2014-2015 hinder higher achievement in chemistry. This study therefore aims to strengthen the relationship of self-regulation to achievement and to test anxiety. Once the relationship is established, self-regulated learning could be employed to help lessen and control test anxiety thereby increasing achievement in Chemistry. In addition, self-regulated learning could aid students develop positive attitude towards chemistry and improve their motivation to learn science.

Statement of the Problem

This study investigated the resulting outcome of self-regulation to students' test anxiety and achievement in chemistry. Specifically, it sought to answer the following research questions:

(i) Does self-regulationsignificantly correlate with students' test anxiety?; and

(ii) Does self-regulation significantly correlate with students' achievement in chemistry?

Conceptual Framework

In view of the literatures presented, figure1 shows how self-regulation will correlate to students' test anxiety and achievement in chemistry.

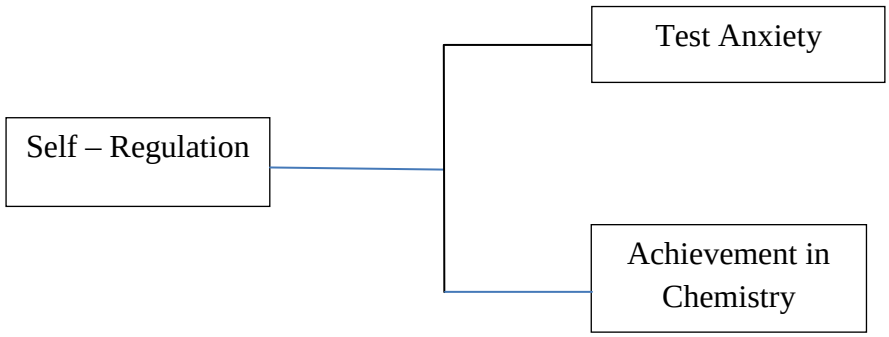

Figure 1. Conceptual Framework of the Study

If you regularly become excessively nervous before and during an important exam, you may have test anxiety. Test anxiety brings symptoms that often interfere with test performance and cause significant discomfort. These symptoms include increased heart rate, digestive problems like nausea, diarrhea, cramping, heartburn, jittery feelings, sweating, shaking, and shallow breathing.

Self-regulated learning is controlled by an interconnected framework of factors that determine its development and sustainability (Bandura, 1993; Boekaerts, 1999; Pintrich, 2000; Zimmerman, 2008) and motivation is a critical factor in this framework (Kurman, 2001; Ommundsen, Haugen & Lund, 2005; Wang & Holcombe, 2010). For example, during the forethought and planning phase, when students consider the reason for the activity's completion and the degree of effort that they have to put towards that activity, their interests and values are factored into the decision (Simons, Dewitte, & Lens, 2000; Wolters&Pintrich, 1998; Wolters, Yu, &Pintrich, 1996). If students do not see value in learning tasks, then, they are less likely to spend much time setting goals and planning strategies to accomplish those tasks. Additionally, students' efficacy beliefs, their confidence in their ability to successfully complete tasks, also play a role, especially during the forethought and planning and performance monitoring phases (Zimmerman, 2000). Research has found self-efficacy and the use of self-regulation strategies to have reflexive positive impacts on one another. Higher self-efficacy beliefs increase the use of self-regulation strategies (Pajares, 2008) and the use of self-regulation strategies can lead to increases in self-efficacy beliefs and academic achievement (Bouffard-Bouchard 1989, Parent, &Larivee, 1991; Schunk, 1984; Schunk& Hanson, 1985; Zimmerman &Martinez-Pons, 1990).

This study investigated the relationships among test anxiety to self-regulation and students' performance. It was hypothesized that test anxiety would have a negative impact on students' test-related perceptions and behaviors across the study. As compared to students with low test anxiety, the high-anxiety group was expected to (a) perceive upcoming tests as more threatening, (b) perform more poorly on exams, and (c) report a greater range of attributions for performance.

Significance of the Study

This study intends to aid science educators in addressing the factors hindering higher achievement in chemistry. It is also intends to develop self-regulation towards chemistry. More so, it aims to promote self-regulation learning as a means of improving students' motivation to learn Science.Furthermore, it seeks to present methods and strategies that teachers can consider to utilize SRL for the purpose of enhancing students' attitude toward learning.

Students

Through the use of SRL, the students could integrate learning with life and work. Consequently, it will help them develop the virtue of cooperation, patience and skills in undertaking Science activities. It would also develop their self -confidence and enhance their self-reliance. In this regard, they will be given a chance to apply their acquired skills at their own rate.

Chemistry Teacher

Teachers could look into SRL as another teaching strategy to upgrade their instruction that would better their teaching effectiveness. More so, SRL could aid them in enhancing students' learning and motivation.

School Administration

It could provide other teachers to use SRL in their teaching. For the school administration this will help to identify what action should take place especially if there is a standardized test. It

would also provide a guide in the preparation, analysis and improvement of the tests for evaluative processes.

Curriculum Planner

For the curriculum developers, it could provide information regarding the SRL strategies so that decision for revision, improvement, and refusal of objectives could be taken. They may also develop topics that may apply self-regulated skills or learning for the students to have higher achievement and avoid or lessen any anxiety when there is an examination.

Future Researchers

For researchers in science education, they may use the result of this study to further investigate whether or not test anxiety is correlated to problem solving skills, decision making skills and self-efficacy.

Scope and Delimitation of the Study

The study only used limited number of samples. Thereby, generalizability of the results are weak. The scope of the study was focused only on the relationship of SRL to test anxiety and achievement in Chemistry.Other factors, such as IQ, and personality, just to name a few that also encompasses the variables used in this study were not given emphasis.

Definition of Terms

For clearer understanding of the present investigation, the following terms used in this study are operationally defined.

Achievement.This is defined as an assessment procedure of gathering data on the students' learning and translating these data into its interpretable form. Seventy-five (75) is the average score which is considered as an achievement; so if student would get lower than seventy-five 75, then, achievement is not obtained.

Self – regulated learning (SRL). This is the ability to develop, implement, and flexibly maintain planned behavior in order to achieve one's goals. It would be manifested in their improved self-confidence and enhanced self-reliance. In this regard, they will show more motivation to apply their acquired skills at their own rate.

Test anxiety. This is a type of anxiety that brings about apprehension and nervousness caused by unidentified threat. Test anxiety brings symptoms that often interfere with test performance and cause significant discomfort. These symptoms include increased heart rate, digestive problems like nausea, diarrhea, cramping, heartburn, jittery feelings, sweating, shaking, and shallow breathing according to the respondents.

Chapter 2

Review of Related Literature

This chapter presents the literature and studies conducted related to self-regulation to students' test anxiety and achievement in chemistry. The review efforts concentrated on the definition and characteristics of self-regulated learning, test anxiety and achievement in chemistry. The following is a summary of literature and studies related to the topic.

Self-Regulated Learning

Self-regulated learning (SRL) is an academically effective form of learning, through which the learner set goals and make plans before starting to learn; monitor and regulate his/her cognition, motivation and behavior during the learning process; and reflect on his/her learning process (Pintrich, 1995; Pintrich, 2000; Zimmerman, 2001).

Self-regulated (S-R) learners proactively seek out information when needed and take the necessary steps to master it. They view acquisition as a systematic and controllable process, and they accept greater responsibility for their achievement outcomes (Zimmerman, 1990).They plan, set goals, organize, self-monitor, and self-evaluate at various points in the learning cycle (Corno, 1986, 1989). They also engage in a "self-oriented feedback" loop – a cyclic process in which students monitor the effectiveness of their learning methods or strategies and react to this feedback in a variety of ways, e.g., they may change perceptions of their ability or change their strategies (Carver &Scheier, 1981).

Student learning and motivation are viewed as interdependent processes. S-R leaners are not merely reactive to their learning outcomes; rather, they proactively seek out opportunities to learn (Zimmerman, 1989). They are self-directed and self-motivated - their skill and will are integrated components of self-regulation.

One way to increase learner responsibility is to develop self-regulated learning skills and encourage learner autonomy (Heo, 2000). Zimmerman (1990) suggested that self-regulated learning process better with three stages: (1) forethought, learners' preparing work before performance on their studying; (2) volitional control, which is also called "performance control", occurs in the learning process. It involves learners' attention and willpower; and (3) self-reflection, happens in the final stage when learners review their performance toward final goals. At the same time, focusing on their learning strategies during the process is also efficient for their final outcome.

Test Anxiety

Testing is probably the primary means of evaluating student performance in school. It also pervades other aspects of our lives: getting a driver's license, or applying for a job. Testing is also one of the primary causes of stress among students. Inaccurate conceptions of expectations towards a test, and ways of preparing for an exam are among the many reasons behind this. In addition, many tests are less than perfect and do not always give an accurate assessment of student ability. Despite this, exams will probably continue to be the main method of student evaluation because they are relatively efficient and objective measures of student performance (Chickering& Schlossberg, 1995).

"Tests can be significant opportunities for learning. They provide deadlines and contexts for assimilating and integrating prior learning. Thoughtful scrutiny of results yields information about gaps and confusions which can guide further learning. So our fundamental point about tests is to use them for learning opportunities, for consolidating prior preparation, for diagnosing purposes when the results are available" (Chickering& Schlossberg, 1995, p. 183).

"Tests may be scored in one of two ways" (Chickering& Schlossberg, 1995, p. 183-184). Most students are familiar with scores based on how well one meets the requirements of explicit criteria. In this case, does not necessarily predict students' test performance. Instead, one's score is based on his/her fulfillment of minimum requirements set forth by the grader. Standardized tests are usually scored on this basis. Students' mental states can greatly affect their performance on exams and their vulnerability to test anxiety. In fact, Kesselman-Turkel and Peterson (1981) noted that forstandardized tests like National Achievement Test(NAT) and National Career Assessment Examination (NCAE), mental preparation is sometimes the only preparation one can do for a test.

Test and examination are evaluative measure used in the academe to assess students' occurrence of learning and understanding lectures (Espinosa, *et al*, 2012). Any type of test surely stimulates anxiety. Anxiety is a generalized mood condition which brings about apprehension and nervousness caused by unidentified threat connoted by Ohman (2000). Barlow (2002) said that the unidentified threat is usually perceived as a negative event which sets individuals in a future-mood state, directing them to be ready and prepared to cope up with it. Hence, Urbina (2004) concluded the thought of being evaluated predisposes students to experience some level

of anxiety since their scores shall be utilized as determinants of significant decisions and consequences. It is then usual for them to experience test anxiety.

Early work defined test anxiety as a singular attribute that could be measured with unidimensional scales (Sarason, 1961). Sarason (1961) proposed that interfering anxieties encountered in evaluative situations were likely a combination of ‘‘heightened physiological activity’’ and ‘‘self-deprecating ruminations’’ (pp. 201–202). Individuals that become highly anxious during tests typically perform more poorly on tests than low-test anxious persons, especially when tests are given under stressful conditions. The feelings of forgetfulness or drawing a “blank” are developed because of anxiety-produced interference between relevant responses and irrelevant responses generated from the person’s anxious state.

Psychologists Liebert and Morris (1967) originally attributed test anxiety to two main components:worry and emotionality.Jones and Petruzzi (1995) said thatworry refers to cognitive factors, such as negative expectations; and emotionality refers to the physical symptoms, such as muscle tension, or butterflies in the stomach.Both are aversive elements that can create anxiety, but it is the cognitive factors that have the strongest connection to performance.

Those students with high-test anxiety and low-self efficacy also tend to perceive tests as threatening events, further promoting the avoidance behaviors. This phenomenon is a matter of the student viewing the upcoming evaluative situation as a stressful event due to the personal harm e.g., on grades, self-esteem, or status, that the test holds for the learner (Lay, Edwards, Parker, &Endler, 1989; Schwarzer& Jerusalem, 1992). Students’ explanations for their perceived threat on testingcome from their generalized low-self efficacy for testing (Bandalos, Yates, &

Thorndike-Christ,1995; Schutz& Davis, 2000) or the specific subject matter is complex and difficult (Everson, Tobias, Hartman, &Gourgey, 1993; Hong &Karstensson, 2002).

Researchers Putwain, Woods andSymes (2010), found that a low academic self-concept was associated with higher worry and tension about their abilities to do well on a test. A student's metacognitive beliefs play an important role in the maintenance of negative self-beliefs.Ogundokun (2011) and Putwain (2008) said that test anxiety threatens student's self-esteem because it gives rises to the fear of failure. They tend to equate test results to personal worth, social recognition, sense of belongingness, and security. The manner by which their performance will be judged and its consequences elicit their feelings of uneasiness, apprehension, or nervousness.

Original research on test anxiety made by Mandler and Sarason in 1952 has concluded that test situations induced, "*feelings of inadequacy, helplessness, heightened somatic reactions, anticipations of punishment or loss of status and esteem and implicit attempts at leaving the situation*" to test anxious subjects (in Udeani, 2012). Udeani (2012) stressed that most experimental investigations suggest that state anxiety, such as test anxiety may adversely affect cognitive processes such as problem solving, incidental learning, ability to communicate, performance on standard intelligence tests, and academic performance. Eventually, it can cause detriment in behavior.

Gender differences emerge in 3^{rd} to 4^{th} year of schooling with female pupils reporting higher test anxiety than males (Wigfield&Eccles, 1989); a robust effect that persists throughout secondary school and into higher education (Putwain, 2007). Cassady& Johnson (2002) noted that females are said to experience greater amount of anxiety because they have

higher levels of emotionality. It has also been stressed that they may have greater preoccupation with their personal inadequacies, leading to their increased degree of public self-consciousness. Thereby, it results to an increase amount of worry and discomfort in evaluative conditions (Asghari, *et al.*, 2012). Inverse relationship between test anxiety and achievement would be stronger for students who have, for example, ineffective coping strategies (Söber, 2004), more negative cognitive appraisals (Putwain, Connors &Symes, 2008), and more unhelpful metacognitive beliefs, for example, that worry helps coping (Mathews, Hillyard& Campbell, 1999).

In a study conducted among Kuwaiti adolescents, Khalek (2002) revealed that regardless of gender, individual's ages 14-18 years of age reflected high levels of anxiety. With regard to ability, significantly negative correlation between general intelligence and test anxiety has been recorded. Results of the study conducted by Khalid and Hassan (2009) indicated that high achievers showed lesser amount of anxiety than low achievers. Therefore, the latter may have lower ability and less than average academic performance.

Test anxiety, despite its negative implications, also renders positive outcomes in learning situations (Espinosa, *et al*, 2012). Putawin (2008) synthesized that some students who have high test anxiety exerts more effort in studying and have good study skills compared to students who have low test anxiety. Their high level of anxiety functions as a compensatory device for them to overcome the negative effects that come with it (Espinosa, *et al.*, 2012). Cassady and Johnson (2002) added data to further strengthen the advantageous effect of moderate levels of anxiety on higher exam performance. They measured the emotionality component of test anxiety which

included physiological responses experienced during evaluative situations.Thus, the correlation of anxiety to behaviors does not exclusively show linear relationship (Akman, *et al.,* 2007).

Achievement in Chemistry

Assessment is a process of gathering data on the students' learning and translating these data into its interpretable form. There are generally two types of assessment: summative and formative**,** depending on the purpose of conducting the assessment. Surgenon (2010) said that summative assessment is "graded and recorded". Meanwhile, formative assessment is otherwise. Students can "take risk" in giving answers and learning from their mistake. Hence, students will have little to moderate degree of anxiety.

According to Torrance (1995), assessment is an integral part of the education process that promotes the learning of the child by providing 'feedback' and 'feedforward'. Assessment may also be used to improve the learners' skills as well as identify their deficiencies. At the same time, testing results may also guide the teachers in focusing their instructions (Tombari&Borich, 1999, Gronlund& Linn, 1990).

Testing is one of the best tools to assess learning and improve teaching (Firestone, Schorr&Monfils, 2004). As mentioned earlier, summative test is important especially in formal education**.** Through this, teachers can determine students' achievement based on the desired outcome predetermined by the teacher or curriculum. There are various ways to conduct summative assessment. This includes written Examination, and portfolios or performances, just to name a few.

High achievement in test scores was also observed by Campbell, Allie, Buffler and Lubben (2001) when students were engaged with science concepts and laboratory procedures. Stohr-Hunt (1996) investigated on hands-on activity or experiential learning and science achievement on eighth grade students. Based on the result, significant differences existed across frequency variable with respect to science achievement.

Okebukolaand Ogunniyi (2006) investigated the learning and acquisition of science skills between cooperative, competitive and individualistic laboratory patterns. It was found out that the cooperative group was superior on the achievement measure and no difference was found between the competitive and individualistic groups. In the research of Al-Naqbi and Tairab (2005) about practical laboratory work, they found out that active engagement and participation of students in laboratory activities positively increase students' acquisition of knowledge, process skills and scientific attitudes. Dahlstrand and Coster (2011) also have the same finding that student's level of active participation positively predicts acquisition of science process skills.

Performance-based test is a means to assess students' skills performance based on tasks related to their academic knowledge. In science, performance based test is a very important way to assess students' achievement. In addition, conventional academic predictors such as written examination may limit predictive validity in terms of academic performance compared to performance-based tests (Tanilon, Vedder, Segers&Tillema, 2011).

Chapter 3

Methodology

This chapter describes the research design, respondents of the study, sampling design, research instrument and its validation process, data gathering procedure and the statistical tools utilized for analysis.

Research Design

Predictive correlational method of research was adopted in this study. This research method is used to determine the degree of relationship that exists between or among variables. In this study, self-regulated learning is correlated with test anxietyand achievement in Chemistry.

This method helped the researcher to identify to obtain facts and to direct experiences of the students to elicit needed data which were revealed by the result of their achievement.

The sample

This studyutilized fourth year high school students belonging to a Science section from Las Piñas National High School during the school year 2014-2015. This section is composed of thirty seven (37) students, twenty one (21) males and sixteen (16) females.

The instruments

Three research instruments were utilized in the study. The Self – Regulation Questionnaire (SRQ)was used to assess self – regulatory process through self-report Test Anxiety Questionnaire (TAQ)was used to determine student's level of anxiety. Lastly, Achievement Test wasused tomeasure student's achievement in chemistry.

Self – Regulation Questionnaire (SRQ)

This instrument was adopted (see appendix 1) by the researcher and intended for the students. The SRQ was developed to assess self-regulatory processes through self-report. Items were developed to mark each of the seven sub-processes of the Miller and Brown (1991) model, forming seven rationally derived subscales of the SRQ.

The SRQ was pilot tested to fifty two (52) students of fourth year Rizal, first section of the regular class in Las Piñas National High School during the first quarter of School Year 2014-2015. Data collected was subjected to reliability coefficient Cronbach alpha to establish the reliability of the instrument. The computed Cronbach alpha was 0.830. This reliability coefficient is acceptable because according to Brown and Miller (1991), the acceptable values of alpha ranges from 0.70 to 1.00.

Test Anxiety Questionnaire (TAQ)

The Suinn Test Anxiety Behavior Scale (STABS) (see appendix 2) was developed by Richard M. Suinn and was published by the journal Behavior Research and Therapy in 1968. The STABS was revised by the Student Learning Assistance Center of Texas State University in San Marcos in 2002 and coined the title Test Anxiety Questionnaire (TAQ). The revised form was utilized in this study that composed of a forty eight (48) – item Likert scale inventory.

Achievement Test

The achievement test (see appendix 3) was a teacher made questionnaire consisting of fifty (50) multiple choice items. Quarterly examination or achievement testincluded the following topics: matter as an element, compound or mixture, periodic table of elements,

physical and chemical properties of chemicals, acid and base and its pH, structure, nomenclature and functional group of organic compounds.The achievement test was content and face validated by three experts in chemistry.

Achievement test was pilot tested to fifty two (52) students of fourth year Rizal, first section of the regular class in Las Piñas National High School during the first quarter of School Year 2014-2015. Data collected was subjected to reliability coefficient Cronbach alpha to establish the reliability of the instrument. The computed Cronbach alpha was 0.700.

Data Collection Procedure

Data were gathered during the first quarter of school year 2014-2015 at Las Piñas National High School.Respondents were composed of thirty seven (37) students fromFourth year Newton, which are among their Science Section. Self – regulation Questionnaire was given first. Then, it was followed by the Achievement Test. Test Anxiety Questionnaire was given last to eliminate possible threats to validity. The study only wanted to measure students' perception of testing event.

The perception of a testing event as threatening impacts student performance in the preparation phase generally through the engagement of ineffective preparatory strategies drivenby feelings of helplessness, attempts to avoid or reduce the occurrence of failure, or poor emotional self-regulation during the exam itself (Covington, 1985).

Data Analysis Procedure

All computation and analyses of data were done using the SPSS. The level of confidence in all statistical treatment was set at 0.01. Cronbach alpha were computed from the data obtained

in the pilot testing to establish the reliability of the Self – Regulation Questionnaire (SRQ), Test Anxiety Questionnaire (TAQ), and Achievement Test.

There are 63 items in SRQ. Data was interpreted by using the Likert 5 point scale. All 63 items were answered on a 5-point Likert scale with the following scale points: 1-Strongly disagree, 2-Disagree, 3-Uncertain or Unsure, 4-Agree and 5-Strongly Agree. It presented the 63 items, the subscales to which they were logically assigned, and the items that were to be reverse-scaled (R). The seven subscales are for research purposes only.

Scatter plot was used to identify if the relationship between variables, e.g. test anxiety and achievement and test anxiety and self-regulated learning is linear, nonlinear, or uncorrelated. Pearson's product moment correlation was used to identify the strength of linear relationship, given by table 1.

Table 1.Coefficient of correlation and strength of relationship

Coefficient of Correlation	Strength of Relationship
± 0.70 – 1.00	Strong
± 0.30 – 0.69	Moderate
± 0.00 – 0.29	None to Weak

Source: Cresswell, J. (2008). Educational research: Planning, conducting, and evaluating quantitative and qualitative research. New Jersey: Pearson: Merrill Prentice Hall

Chapter 4

Presentation, Analysis, and Interpretation of Data

This chapter presents the respondents and computed results to investigate the resulting outcome of self-regulation to students' test anxiety and achievement in chemistry. These data have been analyzed and shown in tables and figures.

Self-Regulation Learning and Students' Test Anxiety

A scatter plot was constructed to determine the relationship between self – regulated learning and test anxiety. Figure 2 shows that the two variables under study have no correlation.

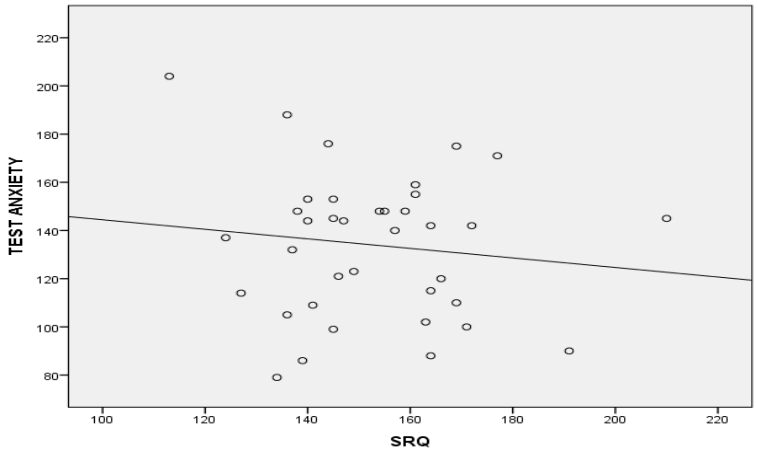

Figure 2. Self-Regulated Learning vs. Test Anxiety in Chemistry

Analysis of the data showed in the scatter plot in Figure 2 using two – tailed Pearson's *r* indicated that self – regulation and test anxiety has a non-significant, none to weak negative correlation, $r = -.126$, $p = -.047$ (see appendix H). Table 2 shows the summary of the results.

Table 2. *Pearson's Moment of Correlation of Self-Regulation and Test Anxiety*

Scale	*r*
Self-regulation[a]	
	-.126
Test Anxiety[b]	

[a,b] *n=37*

**p<.01*

Results of self-regulation questionnaire (*M*=152.78, *SD*=18.91), showsthat students have a "low or impaired self-regulation capacity". Thus, some of the students have negative self-esteem, self-statement and poor motivation. It seems that some of them may have inadequate study skills as well as test-taking skills. This is possibly due to the fact that consumer chemistry is just their elective subject; thus, they really do not seem to put so much effort on it.

Test anxiety may also affect students' self-regulation towards chemistry. Academic achievement and positive attitude towards chemistry are important outcomes of science education (Zimmerman, 2001). Students with high-cognitive test anxiety often report that they knew the information before the test, but when they entered the testing room, the information mysteriously escaped them. Barlow (2002) said that the unidentified threat is usually perceived as a negative event which sets individuals in a future-mood state, directing them to be ready and prepared to cope up with it.

Result shows that students were able to overcome or control their test anxiety. Results of the test anxiety questionnaire (*M*= 134, *SD* = 29.77), reveal that students have "a normal

amount" of test anxiety. This is possibly because the students already acquired the knowledge prior to taking the test. Empirical investigation of this ''anxiety blockage phenomenon'' has revealed that this pattern generally occurs only in situations where the student has high-test anxiety, good study skills, and the test items are easy (Covington &Omelich, 1987).

Respondents are mostly 14-18 years of age. Some of them reflect high level of anxiety. Khalek (2002) mentioned that 14-18 years of age reflect high level of test anxiety. This is contrary to the results reflected in this study. Respondents have normal amount of test anxiety. Has also been stressed that they may have greater preoccupation with their personal inadequacies, leading to their increased degree of public self-consciousness. Thereby, it results to an increase amount of worry and discomfort in evaluative conditions (Asghari, *et al.*, 2012).

Mostly female students have higher amount of test anxiety (see appendix F). Some female students shown higher amount of test anxiety.Gender differences emerge in 3^{rd} to 4^{th} year of schooling with female pupils reporting higher test anxiety than males (Wigfield&Eccles, 1989); a robust effect that persists throughout secondary school and into higher education (Putwain, 2007). Individuals that become highly anxious during tests typically perform more poorly on tests than low-test anxious persons, especially when tests are given under stressful conditions. The feelings of forgetfulness or drawing a "blank" are developed because of anxiety-produced interference between relevant responses and irrelevant responses generated from the person's anxious state (Sarason, 1961).Inverse relationship between test anxiety and achievement would be stronger for students who have, for example, ineffective coping strategies (Söber, 2004), more negative cognitive appraisals (Putwain, Connors &Symes, 2008), and more unhelpful metacognitive beliefs, for example, that

worry helps coping (Mathews, Hillyard& Campbell, 1999). Cassady& Johnson (2002) noted that females are said to experience greater amount of anxiety because they have higher levels of emotionality.

Self-Regulation and Students' Achievement in Chemistry

A scatter plot was constructed to determine the relationship between self-regulation and achievement in chemistry. Figure 3 shows that the two variables under study have positive correlation.

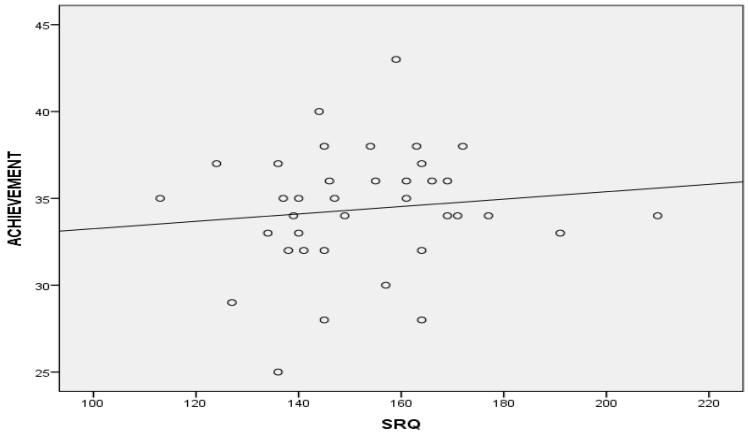

Figure 3. Self-Regulation vs. Achievement in Chemistry

Analysis of the data displayed in the scatter plot in Figure 3 using two – tailed Pearson's *r* indicated that self-regulation and achievement in chemistry has a non – significant, none to weak positive correlation, $r = .115$, $p = .126$ (see appendix I) This shows that test anxiety isnot significantly correlated to achievement in chemistry. Table 3 shows the summary of the result.

Table 3.*Pearson's r Moment Correlation of Self-Regulation and Achievement*

Scale	*r*
Self-Regulation[a]	
Achievement in Chemistry[b]	.115

[a,b]*n=37*

**p<.01*

Test and examination are evaluative measure used in the academe to assess students' occurrence of learning and understanding lectures (Espinosa, *et al*, 2012). Any type of test surely stimulates anxiety. Those students with high-test anxiety and low-self efficacy also tend to perceive tests as threatening events, further promoting the avoidance behaviors. This phenomenon is a matter of the student viewing the upcoming evaluative situation as a stressful event due to the personal harm e.g., on grades, self-esteem, or status, that the test holds for the learner (Lay, Edwards, Parker, &Endler, 1989; Schwarzer& Jerusalem, 1992).

Testing is one of the best tools to assess learning and improve teaching (Firestone, Schorr&Monfils, 2004). Based on the result, non-significant differences existed across frequency variable with respect to science achievement.

Results of the achievement (M = 34.38, SD = 3.50) shows that students got a high score. Only few of them got low score. Self-regulation is essential to the learning process (Jarvela&Jarvenoja, 2011; Zimmerman, 2008). It can help students create better learning habits and strengthen their study skills (Wolters, 2011), apply learning strategies to enhance academic outcomes (Harris, Friedlander, Sadler, Frizzelle, & Graham, 2005), monitor their performance

(Harris et al., 2005), and evaluate their academic progress (De Bruin, Thiede& Camp, 2011). Thus, teachers should be familiar with the factors that influence a learner's ability to self-regulate. They should also know the strategies they can use to identify and promote self-regulated learning (SRL) in their classrooms. In addition to self-regulation, motivation can have a pivotal impact on students' academic outcomes (Zimmerman, 2008). Without motivation, SRL is much more difficult to achieve. Research shows that self-regulation and students' learning and achievement are positively correlated (Schunk, 1981).

From the results enumerated, test anxiety is therefore insignificantly correlated to higher achievement in chemistry, they were able to overcome or control their test anxiety. Results show that there was a "normal" amount of test anxiety. Results of the test anxiety questionnaire (*M*= 134, *SD* = 29.77), reveal that students have "a normal amount" of test anxiety. Cassady and Johnson (2002) added data to further strengthen the advantageous effect of moderate levels of anxiety on higher exam performance. They measured the emotionality component of test anxiety which included physiological responses experienced during evaluative situations.Therefore, *the negative thoughts and depreciating self-statements that occur during assessments and the performance-inhibiting difficulties that may arise from anxiety* were lessen (Zeidner, 1998, in Putwain, 2008, pp. 1026-1027). Based on the result of their achievement test, students have high achievement. They were able to control their test anxiety with the help of SRL. Although, some of them have higher amount of test anxiety, they got high score in their achievement.Self-regulated learning promotes higher achievement and lessens or controls the test anxiety experience by the students before, during, and after the examination.

Given that students were prepared for the examination, they were able to conquer their test anxiety; therefore, it did not affect higher achievement in science. Self-regulation towards science was also unrelated to test anxiety. One's attitude towards the discipline is predicted by factors other than a single stimulus.

Chapter 5

Summary, Conclusion and Recommendation

This chapter presents the summary, conclusion and recommendation of this study.

Summary

The study determined if self-regulation is related to students' test anxiety and achievement in chemistry. The study utilized the prediction correlational research, designed to examine how self-regulation, the predictor variable, will affect students' test anxiety and achievement.

A total of thirty seven (37) students from the science section participated in the study. It was composed of twenty one (21) male and sixteen (16) female of fourth year students from a state school in Las Piñas, during the first quarter of school year (SY) 2014 - 2015. The scope of the study was focused only on the relationship of self-regulated learning (SRL) to test anxiety and achievement in Chemistry.

Instruments used in the study were: (1) Self-Regulation Questionnaire (SRQ) for measuring students' attitude towards science; (2) Achievement Test for assessing students' achievement and; (3) Test Anxiety Questionnaire (TAQ) for evaluating students' level of anxiety. The instruments were all content validated by panel of experts and were pilot tested.

The results suggested that higher achievement in science and self-regulation towards chemistry are all insignificantly correlated to test anxiety. Given that students were prepared for

the examination, they were able to conquer their test anxiety; therefore, it did not affect higher achievement in science. Self-regulation towards science was also unrelated to test anxiety. One's attitude towards the discipline is predicted by factors other than a single stimulus.The results suggest that higher achievement in chemistry and self-regulation towards chemistry are all insignificantly to test anxiety.

From the results enumerated, test anxiety is therefore insignificantly correlated to higher achievement in chemistry, they were able to overcome or control their test anxiety. Results show that there was a "normal" amount of test anxiety. Cassady and Johnson (2002) added data to further strengthen the advantageous effect of moderate levels of anxiety on higher exam performance. They measured the emotionality component of test anxiety which included physiological responses experienced during evaluative situations.Therefore, *the negative thoughts and depreciating self-statements that occur during assessments and the performance-inhibiting difficulties that may arise from anxiety* were lessen (Zeidner, 1998, in Putwain, 2008, pp. 1026-1027).

Based on the result of their achievement test, students have high achievement. They were able to overcome their test anxiety with the help of SRL.Thus, the correlation of anxiety to behaviors does not exclusively show linear relationship (Akman, *et al.*, 2007).

Conclusion

From the results enumerated, the following conclusions were drawn from the study:

1. Self-regulation is insignificantly correlatedto students' test anxiety; and
2. Self-regulation is significantly correlated tostudents' achievement.

The study strengthened the relationship of self-regulated learning and higher achievement. However, it is significantly unrelated to test anxiety. As shown in the results, respondents' test anxiety falls within the acceptable range. Seemingly, despite their low (impaired) self-regulation, their observed preparation for the test accounted for their high scores. As stated, one's attitude towards the discipline is predicted by factors other than a single stimulus. However, self-regulated learning should still be considered as another means of teaching strategy in Chemistry class. It could actually integrate learning with life and work. Along this line, it will also help them develop the virtue of cooperation, patience and skills in undertaking Science activities. More so, it would develop their self -confidence and enhance their self-reliance. Thereby, they will be given a chance to apply their acquired skills at their own rate.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are suggested:

For future researchers in science education, investigate whether or not test anxiety is correlated to problem solving skills, decision making skills and self-efficacy. Moreover, change the design of the data gathering procedure. Instead of giving the test anxiety questionnaire after the science achievement test, let the students answer it prior to taking the aforementioned examination.

For the teachers, you may use self-regulated method or strategies in teaching science class. This will help the students to overcome or avoid any test anxiety and perform well in class.

For the school administration, this will help to identify the anxiety of the students before, during and after examination. This will help to identify what action should take place especially if there is a standardized test.

For the curriculum developers, you may develop topics that apply self-regulated skills or learning of the students to have a higher achievement and avoid or lessen any anxiety when there is an examination.

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