Scientific Literacy, Teachers' Self-Efficacy and Teaching Proficiency of 21st Century Science Teachers

Maria Theresa A. Gonzaga
mariatheresa_gonzaga@uv.edu.ph
University of the Visayas
Cebu City

ABSTRACT

This investigation determines the level of scientific literacy, teachers' self-efficacy and teaching proficiency of the science teacher in the Division of Sagay City according to their age, sex, civil status, the length of service, undergraduate preparation and the number of hours attended. The descriptive - correlational research design specifically the quantitative descriptive survey method was employed in this study with forty - two randomly selected high school science teachers, the respondents were given three sets of instruments, the Teachers' Self-Efficacy Scale questionnaire, Evaluation for Teaching performance and the Scientific Literacy Skill Test questionnaire. Mean, t-test for independent means and analysis of variance were the statistical tools used. Findings revealed that the level of scientific literacy of the science teachers when taken as a whole and when grouped according to the selected variables was basic except on non-education graduates which is observably high but shows no significant difference. Moreover, science teacher's teaching self-efficacy, results disclosed that there is no significant difference in the level of teaching self-efficacy of science teachers when grouped according to selected variables such as age, civil status, length of service and training. However, when dimension was considered individually, there is a significant difference in the level of science teachers teaching proficiency in terms of planning but not when they are grouped according to civil status. This means scientific teachers when taken as a whole and when grouped according to the selected variables were proficient enough in teaching the subjects and have mastery of the subject matter. Meanwhile, it was noted that there is no significant correlation among science teachers' scientific literacy, self-efficacy, and teaching proficiency.

Keywords: *21st Century science teachers, scientific literacy, teacher's self-efficacy, teaching pro-ficiencycacy, teaching proficiency*

INTRODUCTION

Twenty-first century learning is associated with the quality of learning environment and the quality of teaching as well. Many reforms on the development of the education system that lies on the hand of the preexisting scenario of what teaching and learning process really takes place in the field. This is, in response to the inevitable battle of the Department of Education to commence and fulfill the ultimate goal which is to achieve quality education specifically in science education (Asian Development Bank, 2011). Likewise, a global vision of Project 2000+ by UNESCO in the 1993, that urged agencies, NGOs, IGOs and governments to strengthen the capability of countries for designing, planning and implementing program to enhance scientific and technological literacy for all.

Department of Education emphasizes the importance of Science education which aims to develop scientific literacy among the primary and secondary school students (Berito, 2015). As stated in the 1987 Philippine Constitution under Article XIV, Section 3, paragraph 2 that the state shall…encourage critical and creative thinking, broaden scientific and technological knowledge. Under section 10, likewise mentioned the State shall give priority to research and development, invention, innovation, and their utilization; and to science and technology education, training, and services. It shall support indigenous, appropriate, and self-reliant scientific and technological capabilities, and their application to the country's productive systems and national life.

The application of knowledge to science and technology-related life situations contributes to students' competencies. Thus, developing concepts and principles of science alone is similar to teaching history of science and is not an optimal step to envision what the state requires.

In the broader sense, education system must develop scientific and technological "literacy" to all. To Sulaiman (2013) the word literacy comes from the Latin word "Litteratus" formed from the word "littera" which means "letter". It connotes "Man of Letters" or a "Learned man". Furthermore, through evolution the meaning of literacy has changed into "ability to read, write and compute" which is the same as "basic literacy". Sulaiman (2013) concluded that scientific literacy is a higher level of basic literacy. United Nation Education, Scientific, and Cultural Organization (UNESCO, 2000) stated that scientific literacy includes ability to apply scientific and technological concepts and process skills to the life, work and culture of one's own society. Scientific Literacy likewise stresses the development of habits of mind to facilitate individual and group problem solving (American Association for the Advancement of Science AAAS, 1990). Concept of scientific literacy refers both to a knowledge of science and science-based technology. New scientific knowledge enables new technologies. Hence, technology seeks the optimal solution to a human problem and there may be more than one optimal solution. In contrary, science seeks the answer to a specific question about the natural material world.

If science education were to help students construct knowledge on scientific phenomena and reason, think critically and logically, and solve problems, science educators must by all means provide opportunities and experiences to their students (Damasco, 2013). This implies that acquiring education or being educated is far different from being scientific literate. Being "educated" means people who possess the knowledge, while, being scientifically "literate" means those who can read about, comprehend, and express opinions on scientific matters. Finally, this also implies that effective science instruction and innovative teaching strategies provides more students the opportunity to discuss logically and debate scientific ideas.

On the contrary, Bandura (2006) opines that knowledge alone does not ensure effective practice, individuals must also be guided by the belief in their ability to use their knowledge in a given context. This is a challenge that every professional science teacher must embrace and persistently work. Views in one's ability to perform a task correctly play a significant role in learning (Loo & Choy 2013; Williams & Takaku 2011). Bandura (2006:3) defines self-efficacy as the 'beliefs in one's capacities to initiate

and execute the courses of action required in producing given outcomes. Concomitant to this end, teacher self-efficacy has significant implications for school effectiveness as a whole. Teachers' self-efficacy may serve as the key mediating factor between a school's climate and professional culture and its educational effectiveness (Bobbett, 2001; Tshannan-Moran, Hoy, & Hoy, 2001).

In education, it is deemed essential to recognize and understand how proficiency works, Professor Hans-Jürgen Krumm (2013) describes that the competence of instruction is a combination of teachers' expertise and didactic knowledge skills, practical teaching experience gained over time, insights, and attitudes, above all on interaction with students and the teacher's role. Hattie (2009) also describes this teaching proficiency as the teacher's openness to experience, willingness to learn from errors, readiness to seek and learn from constructive feedback done both from students and who foster effort, clarity and engagement in learning. Effective science educators, self- perceived efficacy and teaching strategies and clear, relevant examples of science and technology (at primary, secondary, tertiary or adult education) are critical parts of being critically literate and becoming involved in global issues beyond the personal. These are the principal components to address wisely the declining result of science and mathematics performance. Despite the attention and immediate actions to expand and refine the education sector, problems on scientifically literate students not only in the Philippine Education but also worldwide is still an issue. According to Grant and Lapp (2011) being part of persistent efforts in achieving scientifically literate students, educational reforms also stress the need for a scientifically literate teacher with an essence and values of self- efficacy and proficiency (Bybee and Fuchs,2007).

The impact of the current literacy education makes it a pervasive force in education to study scientific literacy, teachers' self-efficacy and teaching proficiency of the science teachers. It is in this context that the researcher is interested in conducting an investigation on the scientific literacy as a basis for science teachers' self- efficacy and teaching proficiency.

STATEMENT OF THE PROBLEM

The primary purpose of this study is to determine the levels of scientific literacy, teacher's self- efficacy and teaching proficiency of the science teachers.

Specifically, this study answers the following questions:

1. What is the scientific literacy level of the science teachers when taken collectively and grouped according to age, sex, civil status, educational attainment, the length of service and number of hours in training attended?

2. What is the teaching self-efficacy levels (as determined by Bandura's Teacher Self-efficacy Scale) of the science teachers when facts were taken collectively and when grouped according to the variables mentioned above?

   2.1 Student Engagement
   2.2 Instructional Strategies
   2.3 Classroom Management

3. What is the teaching proficiency level (as determined by the Evaluation on Teaching Performance) of the science teachers when grouped and compared according to variables mentioned above?
   3.1 Planning
   3.2 Development
   3.3 Result

4.Is there a significant difference in the scientific literacy level of science teachers when they are grouped and compared according to variables mentioned above?

5. Is there a significant difference in the level of teaching self-efficacy of science teachers when they are grouped and compared according to variables mentioned above?

6. Is there a significant difference in the level of teaching proficiency of science teachers when they are grouped and compared according to variables mentioned above?

7. Are there significant relationships exist among science teachers' scientific literacy, teaching self-efficacy and teaching proficiency?

HYPOTHESES

The following hypotheses were advanced concerning the study:

1. There is no significant difference in the level scientific and technological literacy of science teachers when they are grouped according to age, sex, civil status, educational attainment, the length of service, and training's attended.

2. There is no significant difference in the level of teaching self-efficacy of science teachers when they are grouped and compared according to variables mentioned above.

3. There is no significant difference in the level of teaching proficiency of science teachers when they are when grouped and compared according to variables mentioned above.

4. There is no significant correlations exist among science teachers' scientific literacy, teaching self-efficacy and teaching proficiency.

THEORETICAL AND CONCEPTUAL FRAMEWORK

This study is anchored on the theories and concepts of teachers' self-efficacy (Bandura, 1986), teachers' teaching proficiency, and scientific literacy (RA 10533). Bandura's self-efficacy theory, as presented by Weibell (2011) highlights the rationale of this study in which the concept of self-efficacy is anchored upon that serves as a means of creating and strengthening expectations of personal efficacy. Research has shown that one's beliefs about capabilities to produce designated levels of performance that exercise influence over events that affect their lives explains one self-efficacy (Bandura, 1994). Studies agree that teachers' attitudes and beliefs embedded in an overlapping network of belief systems (Jones & Carter, 2007). Snyder and Lopez (2007) define self-efficacy as the individual believes he or she can accomplish using his or her skills under certain circumstances and withal has been thought to be a task-specific version of self-esteem (Lunenburg, 2011).

Teaching is a process that includes several components, the underlying dimension that teaching efficacy may influence the learner. In this study information on the self- efficacy of science teachers were derived from the three facets of self- efficacy as proposed by Tschannen-Moran and Woodfolk Hoy (2001) in Bandura, (1994). These are the efficacy in student engagement, effectiveness in instructional strategies and efficiency in classroom management. Efficiency in student engagement speaks of teachers' belief in helping and motivating students to think critically; motivates students to show interest towards school works; guiding students to value learning and beliefs of assisting families in helping their children to do well in school. Supported by the study conducted by Tschannen-Moran (2001) considers the extent to which the teacher believes he or she has the capability to affect student performance. Guskey and Passaro (1994): revealed that teachers' beliefs or conviction could influence how students learn, even those who may be difficult or unmotivated.

Efficacy of instructional strategies, on the other hand, delves on teachers' self-efficacy in dealing with instructions in the classroom. These include teachers' skills in the art of questioning, leveling of lessons to learners' capacity using a variety of assessment, and using alternatives in the classroom (Pelaez, 2013). Woolfolk Hoy et al. (2009) conclude teachers judgments are the result of an interaction between (a) a personal analysis of teaching task in context and (b) a self-assessment of teaching competence.

Lastly, efficacy in classroom management encompasses activities concerning teachers' skills in dealing with behavior in the classroom; establishing routines; and responding to defiant students. As a whole, this facet discusses teacher's beliefs in managing the affair of the class which specifically deals with classroom behaviors. Findings made by Davis, Fedor, Parson, & Herold (2000) as cited in Redmond (2010) that support the premise of self-efficacy reveals individuals who perform well develop high self- efficacy. Likewise, it has been found to lead to higher performance.

Understanding science and how students learn science to aid in forming a set of beliefs

that guide practice and behavior within the classroom (Bryan, 2012; Riggs & Enochs,

1990). Substantially, science teachers' content knowledge plays a significant role in their science teaching efficacy beliefs (Palmer, 2006; Posnanski, 2002). Marshall, Horton, Igo, and Switzer (2008) studied over a thousand teachers at the elementary and secondary levels and found that teachers with higher self-efficacy were more likely to have their students engage in inquiry.

Moreover, according to Popoola and Owule in 2007 showed a significant correlation in the case of employees when demographic variables are compared to career commitment. Age, gender, marital status, job tenure, and the educational level considered germane to career commitment. Bhanthumnavin (2003), for example, found gender as correlated to performance ratings. In another study, age is considered as associated with career commitment in human service professionals (Cherniss, 1991). Another explanatory variable that may potentially have a large effect on job performance is ethnicity.

Teaching expertise as referred to proficiency serves as the guiding dimension in this study. Proficiency means the knowledge, abilities, and attitudes which teachers need to have to promote learning processes and design lessons (cf. Reinmann 2011). It can be proficiency levels, scales, and cut-off scores on standardized tests and other forms of assessment. Researchers support the notion that the higher levels of teacher knowledge in subject matter also contribute to the higher achievement of the student (Chaney, 1995; Goldhaber and Brewer, 1997, 2000). Teacher knowledge and instructional expertise have found in correlational and pre- and posttest studies to be related to student reading achievement Reid & Weiser, 2009. Hence, teaching proficiency and approaches to science delivered by the teacher are integral to science education (Schweingruber and Shouse, 2007).

As guided by RA 10533 known as an act "Enhanced Basic Education Act of 2013,"

the Basic Education Curriculum Development of the Department of Education adheres to the following standards and principles. To ensure quality instruction and effective teaching, as a mandate in section 10.2 of the said Act stipulating; the curriculum must be learner- centered, inclusive and developmentally appropriate. It must be relevant, responsive and research-based. It must be gender and culture-sensitive. It must be globally contextualized. It must use pedagogical approaches that are constructivist, inquiry-based, reflective, collaborative and integrative.

Cited in the K to 12 curriculum goals in science education, Science education aims to develop scientific literacy among learners that prepares them to be participative citizens who can make judgment and decision regarding applications of scientific knowledge that may have social, health, or environmental impacts. Moreover, science promotes a strong link between science and technology, including essential technology, thus preserving our country's cultural heritage. To be part of the emerging global village of the 21st-century one must become scientifically and technologically literate.

strategies; and maintain a positive outlook in teaching challenging students (Scharlach, 2008). Teacher's perceived self-efficacy sets more challenging goals and maintain the high sense of efficacy in teaching and can motivate students and enhance students' cognitive development. Also, proficient performance is partly guided by higher-order self-regulatory skills.

In this study the level of scientific literacy will be determined to address issues on the self- efficacy in relation also to the teaching proficiency of 21st Century science teachers. This study includes variables such as age, gender, civil status, educational attainment, major, grade level taught, length in service, trainings attended and performance rating. These are the variables that will influence result to better learning. The result of this study will present the current status of teachers' scientific literacy, teachers' self-efficacy and teaching proficiency in the field. The active involvement of the teachers to produce high - track students critically and scientifically able are profoundly shaped by science and technology.

To Blake (2015) science literacy requires critical thinking and engaging activities. To understand and engaged in significant activities and discussion involves a concept of science and technology. PISA (2013) claims scientifically literate embodies the purpose of science education anchored to the concept of scientific literacy where both comprises the knowledge of science and science-based technology.

Scientific literacy is an appreciation of the basic principles of science that one must grow and comprehend exponentially.

Research in the area of the teacher's beliefs, skills and confidence likewise exemplify a favorable condition to aggravate students' high levels of achievement. Efficient teachers are prone to try various teaching strategies and implement positive classroom management

METHODOLOGY

This investigation was conducted at Sagay City, 81 kilometers away from Bacolod City, the capital of Negros Occidental. The study make used of forty-two (42) Junior High School science teachers randomly- selected respondents.

As this study basically aimed to determine the level of Scientific literacy, self- efficacy, teaching proficiency and its relationship, the descriptive - correlational survey method of research is utilized.

The research made used of standardized instrument consisted of the different parts namely: (a) Scientific Literacy Skills Test, adapted by the researcher from the work of Pedreno, Terregrosa and Murcia (2014); (b) Teacher Self-Efficacy Scale Test, a 24-item test adapted from the study conducted by Tschannen-Moran, Hoy in 2006 and Bandura (2001); lastly, the Teaching Proficiency Evaluation. The instruments were modified and revised according to the recommendation of the validators to suit to the purpose of this study.

The researcher employed the following basis of interpretation and statistical design, to address the specific problems stated in this study:

To determine the level of self-efficacy of the science teachers, the researcher adopted the scale and interpretation of results from the study of Solivio (2011) and Pelaez (2013) the following scales and interpretation were used:

Numerical Description/ Scale	**Verbal Interpretation**
7.41 - 9.00	Very High
5.81 - 7.40	High
4.21 - 5.80	Average
2.61 - 4.20	Low
1.00 - 2.60	Very Low

To determine the level of scientific literacy of science teachers, the researcher follows the scale that determines the interval of scores computed as highest score minus the lowest score divided the range of the interpretation. This interpretation is based on the recommendation and suggestion of the

Range	Interpretation
22.00 - 28.00	Highly proficient
15.00– 21.00	Proficient
8.00 – 14.00	Basic
0.00 – 7.00	Below basic

As to the level of teaching proficiency of science teachers, the researcher adopted the Teacher Performance Index (TPI) in the Competency-based Performance Appraisal System for Teachers (CB-PAST) scale used in interpreting the teacher performance.

Range	Interpretation
4.00 - 5.00	Highly proficient
3.00 – 4.00	Proficient
2.00 – 3.00	Basic
1.00 – 2.00	Below basic

Moreover, Mean, t-test for independent means, analysis of variance (ANOVA) and Pearson-Product Moment Correlation Coefficient (Pearson r) were used to statistically analyze the gathered data.

RESULTS AND DISCUSSION

The discussion of the result includes interpretation and analysis of the data gathered, arranged in tabular forms according to the specific problems and hypotheses of this investigation.

Level of Scientific Literacy of the Science Teachers When Taken Collectively and Grouped according to Age, Sex, Civil Status, Educational Attainment, Length of Service and Number of Hours in Training Attended

Statistical analysis of the data in Table 1 reveals that the level of scientific literacy of the science teachers when taken collectively (M= 11.52, SD= 3.42) is verbally interpreted as "basic". Examination of the data in the table, however, shows that single respondents and the non-teaching profession graduates obtained a slightly higher mean than the married and teaching professional group.
Collectively, this shows that scientific literacy among science teachers with different demographic profile obtained low mean result and that does not reveal any changes in the mean results. This may imply that science teachers experience difficulties in understanding and analyzing science and technology concept.

Table 1 Scientific Literacy Level of the Science Teachers when Taken Collectively and Grouped According to Age, Sex, Civil Status, Specialization, Length of Service and Number of Hours in Training Attended (N=42)

Categories	Mean	SD	Interpretation
Age			
Younger	11.96	4.19	Basic
Older	10.94	3.67	Basic
Sex			
Female	11.24	3.90	Basic
Male	12.56	4.25	Basic
Civil Status			
Single	13.42	3.92	Basic
Married	10.77	3.78	Basic
Length of Service			
Shorter	11.58	4.23	Basic
Longer	11.44	3.60	Basic
Undergraduate Preparation			
Education	11.10	3.79	Basic
Non-Education	14.30	3.40	Basic
Training			
Less	12.38	4.27	Basic
More	10.67	3.51	Basic
As a Whole	11.52	3.96	Basic

Concurrence to the results presented in this regard supports the findings of Rubini, Ardianto, Pursitasari and Permana (2016) that scientific literacy is a remarkable benchmark for determining the high and low quality of science education in a country.

Confirmatory results were revealed in the studies of Bacanak and Gokdere (2009), investigating the primary school teacher candidate level of the scientific literacy. In the conduct of two scientific literacy test to the teacher candidates showed the lowest success rate of 39.70, primary teachers are at least minimally knowledgeable (Alebous, 2013) on the items of science and technology. Rubini & Ardianto (2014) also affirms that upon the recommendation of the study, average scientific literacy teachers was 63% to the overall aspect, which composed of 65% of content, 62% process and 62% applications of science. Based on these findings, the claim that science teachers do not have enough level of scientific literacy is possible.

The table also reflects that regarding the first variable, age, the level of scientific literacy can be interpreted as "Basic" for the younger group (M=11.96, SD=4.19) and (M=10.94, SD= 3.67) for the older group. The results reveal that the level of scientific literacy of both groups is fair even, mean obtained individually is in 1.02 difference for the younger science teacher and are moderately deviated as shown in the standard deviation values presented in Table 1, that means younger science teachers are fair better than the older respondents. However, Anelli (2013) suggests that both must aim at instilling an understanding of scientific inquiry.

Based on the overall recommended findings, Maughan, O'Neale, and Ogunkola (2013) revealed that there are no significant differences in the level of scientific literacy based on level of study and age range (Iúık and Terzi, 2008).Younger and older science teachers are on the same track and pace.

Considering sex as one of the variables, the level of scientific literacy of male (M=12.56, SD= 4.25) and female (M=11.24, SD= 3.90) science teachers with a mean difference of 1.32 was also interpreted as "Basic." Although the results interpretation shows the same, evidently males scored better when compared to females as showed in the mean and the standard deviation values, respectively.

Results of the present study conform to the findings of Maughan, O'Neale, and Ogunkola (2013) that sex greatly contributes most and significantly to the variations in the level of scientific literacy of the undergraduate chemistry students. Data collected from the Program for International Student Assessment in Hong Kong (HKPISA, 2012) suggested that teenage boys dominate girls in most of the cognitive dimensions. Bacanak (2009) and Aina (2014) disclosed similar findings in gender-related differences in science and technology test that male teacher candidates have a correct response than female teacher candidates and shows no significant relation between academic success and scientific literacy (Sulun, Ekiz, and Yurttaz, 2009).

However, as negated in the study of Gaduan (2016) that when females and males were grouped differently in the professional education courses, females ranked consistently higherthanmales. Goni, Aliand Bularafa's (2015) study revealed that female teachers consistently outperformed their male counterparts. The literature showed and confirmed that despite the attainment of scientific literacy by all (male and female) Science and Technology, Engineering and Mathematics (STEM) education is tilting towards low scientific literacy.

One of the variables in this study that is taken into account is the Marital Status or Civil Status; Table 1 reveals the level of scientific literacy of single science teachers (M=13.42, SD= 3.92) and married science teachers (M=10.77, SD= 10.77) as "Basic." The result shows that when grouped according to the marital status, obtained a low result for single science teachers are slightly higher than that of the married science teachers with a mean difference of 1.67, for the science teachers with single marital status.

The result of the study is supported by several findings. Alufohai and Ibhafidon (2015) opines that based on the mean scores obtained by the performance of the students taught by single and married teachers explicitly showed up and performed better, but no significant difference when asked individually. According to Kong (2008), who found single teachers to be more dynamic, more vigorous and motivated in the job. Further discussed by Tyagi (2013) that marital status has influenced the perception of secondary school teachers. Single teachers achieved a higher level of understanding than married teachers concerning their organization. In contrary, Ayeop (2003) concurred that married

teachers very satisfactorily performed their job and found satisfaction in their chosen job. Literature of the studies suggests that when teachers lack sufficient pedagogical content knowledge, that is, teachers does not

in delivering higher order thinking skills. This reflects the result of this study wherein undergraduate education preparations as variable were also used to compare scientific literacy level. The level of scientific literacy of science teachers when grouped according to education preparations, teachers obtained a mean gain of 11.10 with standard deviation of 3.79 and is interpreted as "Basic", on the other hand, considered "Proficient" with mean gains of 14.30 and deviates 0.39 shown in the standard deviation in the table when grouped according to non-education preparation. This discussed an important difference between education and non-education graduates' respondents. A favorable higher mean score obtained by science teachers in non- education preparation. This also disclosed that respondents grouped found in the non-education preparation are mostly graduates of BS. Biology, BS. Nursing, Agriculture, Chemical Engineering and other sciences.

These findings can be proved by the study conducted by Tyagi (2013) that teachers in the different stream like Arts & Commerce are likely to have a higher level of perception than science stream teachers concerning their clarity and presentation. Moreover, research conducted by Zhang (2008) revealed that teacher education played a smaller role in the result of student's outcome, which only when teachers already stay longer in the teaching profession. The analysis of data confirms the Trends in International Mathematics and Science Study 2003 (TIMSS 2003) that the presence of highly qualified teachers in every classroom brings out quality student learning. Lastly, when teachers training attended are taken into context, as shown in the table presented above, the scientific literacy level of science teacher when grouped with a lesser number of hours training attended (M= 12.38, SD= 4.27). It is interpreted as "Basic," same as true when grouped with most numbered hours training attended (M= 10.67, SD=3.57)

The result shows that when grouped according to teachers training's attended, science teachers with less number of hours is relatively higher with 1.71 mean differences based on the obtained mean results than those engaged with most numbered hours training attended. Supported by the study of Wenglinsky (2002) that teachers attending professional development more often does not affect students' achievement, basically, explain teachers does not directly engage with the students.

This result was negated by the summary of findings mentioned by Clotfelter (2005) that evidence had shown better-trained teachers tend to drew out greater student ability. Likewise, Harris and Sass (2008) denied the findings of the present study. Harris and Sass pointed out that professional development that is content- oriented positively influence middle and school math teacher productivity in both pre-service and in-service forms. It can be surmised that for a teacher who is not learning and growing will result in students who are not learning and growing at some point Ghildyal (2015).

Level of Teaching Self-Efficacy of the Science Teachers in Students Engagement, Instructional Strategies and Classroom Management When Taken Collectively and Grouped According to Age, Sex, Civil Status, Educational Attainment, Length of Service and Number of Hours in Training Attended

Results of the analysis of the data shown in Table 2 reveals that the level of teachers teaching self-efficacy in pertain to the student engagement, instructional strategies, and classroom management when taken as a whole is "High" with a mean score of 7.34 and standard deviation of 1.11. However, when facets of teaching self-efficacy is taken individually, obtained mean scores is interpreted as "High" (M =7.32, SD = 1.19); "Very High" (M = 7.44, SD = 1.05); and "High" (M = 7.27, SD =1.10), respectively. Results show that the level of teaching self-efficacy of teachers varies from high to very high as reflected in the data presented, and that is ranging from mean scores of 7.27 to 7.44 and deviates from 1.10 to 1.05 correspondingly. The current study reveals that among the three facets of self- efficacy, the highest mean is obtained in the instructional strategies.

Table 2 Teaching Self-Ef ficacy Levels of the Science Teachers in Students Engagement, Instructional Strategies and Classroom Management When Taken Collectively and Grouped Ac- cording to Age, Sex, Civil Status, Specialization, Length of Service and Number of Hours in Training Attended

Categories	Student Engagement			Instructional Strategies			Classroom Management			As a Whole		
		SD	Int		SD	Int		SD	Int		SD	Int
Age												
Younger	7.31	1.17	High	7.34	1.13	High	7.30	1.21	High	7.32	1.17	High
Older	7.32	1.21	High	7.57	0.91	Very High	7.24	0.94	High	7.38	1.03	High
Sex												
Female	7.27	1.17	High	7.33	1.06	High	7.25	1.14	High	7.30	1.13	High
Male	7.50	1.23	Very High	7.63	0.38	Very High	7.36	1.10	High	7.50	1.06	Very High
Civil Status												
Single	7.23	1.27	High	7.44	1.13	Very High	7.45	1.14	Very High	7.37	1.18	High
Married	7.35	1.15	High	7.44	1.01	Very High	7.20	1.08	High	7.33	1.09	High
Length of Service												
Shorter	7.30	1.21	High	7.33	1.12	High	7.27	1.20	High	7.30	1.17	High
Longer	7.34	1.16	High	7.63	0.89	Very High	7.27	0.93	High	7.41	1.01	Very High
Undergraduate Preparation												
Education	7.22	1.19	High	7.41	1.04	Very High	7.26	1.11	High	7.30	1.12	High
Non-Education	7.92	0.95	Very High	7.60	1.06	Very High	7.33	1.05	High	7.62	1.05	Very High
Training												
Less	7.33	1.19	High	7.33	1.16	High	7.30	1.25	High	7.32	1.20	High
More	7.30	1.19	High	7.55	0.91	Very High	7.24	0.94	High	7.37	1.03	High
As a Whole	7.32	1.19	High	7.44	1.05	Very High	7.27	1.10	High	7.34	1.11	High

The result shows how teachers teaching self-efficacy varies when three facets is taken into account. Teachers own beliefs and views on his or her capacity is considerably influencing. A study headed by Lunenberg (2011) poses that self- belief as referred to self-efficacy has greatly influence people's ability to learn that is reflected on their good performance and motivation to perform the task successfully. These findings support the premise of self-efficacy as cited in Redmond (2010) study that high self-efficacy lead to high performance. As noted in the study of Johnson (2010) conducted in United States to prospective teachers, found out that extensive experiences and modelling positively influenced pre-service teachers' self-efficacy for a better literacy instruction. Thus, Polk (2006) claimed from the study of Pelaez (2013), that personality of the teacher has a ubiquitous influence in the classroom, and has impact to the learning outcomes.

Further analysis of data occurs that when grouped according to age, the level of teaching self-efficacy of younger and older science teachers when facets were taken altogether is "High". This is embodied by the obtained mean scores of 7.32 and 7.38, respectively. Correspondingly, when facets of self-efficacy will be taken individually, the level of teaching self-efficacy of younger respondents in terms of student engagement (M=7.31, SD=1.17), instructional strategies (M=7.34, SD=1.13) and classroom management (M=7.30, SD=1.21) is relatively "High" which is reflected in table 2. On the other hand, older respondents obtained comparatively higher mean. The obtained mean scores reflected in the table ranges from 7.24 to 7.50 and deviated from 1.21 to 0.91 is verbally interpreted as "High".

It can be gleaned from the data that science teachers categorized as older respondents have higher sense of teaching self-

efficacy when compared to the younger ones. This explains that older teacher does better than those younger ones (Figueroa, 2008).

The table also reflects the result of the study when grouped according to sex. The level of teachers teaching self-efficacy of male (M=7.50, SD=1.06) is "Very High" and female (M=7.30, SD=1.13) is "High" when three facets of self- efficacy is taken into consideration. However, when the three facets are taken individually, male teachers possessed a great extent of self- efficacy in terms of student's engagement (M=7.50, SD=1.23) and instructional strategies (M=7.63, SD=0.38). Though female teachers are more homogeneous and shows a slight deviation of 0.07 than males in this study, it still reveals superiority of the male.
Support for this surprising revelation is the study entitled" The role of Self-efficacy and Gender difference among adolescents" conducted by Kumar (2006), Klassen and Chiu (2010) males possess high self-efficacy and perform more, hence, males have better intelligence than female. This explains that women had lesser tolerance to workload stress. Numerous researches noted that female teachers report higher stress level than males (Chaplain, 2008; Ontoniou, Polkychroni and Vlachakis, 2006), Mackay and Parkinson (2010) in South Africa, indicated that males had higher self-efficacy than females, and in study Lui and Ramsey (2008) connotes those female experiences less job satisfaction than male. In contrary to the reports, Arslan (2013) and Ongowo and Hungi (2014), disclosed female teachers' self-efficacy is higher when compared to male teachers. Concurrent to previous report, a Danish study where prospective teachers are dominated by female revealed that in terms of level of empathy, female teachers are higher compared to male teachers. That is the higher the level of empathy, the higher level perceived self- efficacy by the teachers (Anderson, 2011).

As to the civil status, it is gleaned from the table that the level of teaching self-efficacy of

single and married science teachers when taken collectively is "High" with an obtained mean score of 7.37 and 7.33. This means that single and married science teachers almost have the same beliefs to improve the student's learning outcome and creates a better classroom setting. However, when three facets of self-efficacy are taken individually; instructional strategies obtained the highest mean score both in single and married science teachers with the same mean score of 7. 44 and is verbally interpreted as "Very High" with a marked difference of 0.12 in standard deviation. The results show that both single and married science teachers are deeply engaged and took time with the use of instructional strategies in the class. This claim is confirmed by Islahi and Narseen (2013) and Enriques (2010) in the study in Bahrain that marital status or civil status influence significantly teachers' effectiveness in the used of instructional strategies.

This finding deviates from the study conducted by Odanga, Raburu and Aloka (2015) entitled "Influence of Marital Status on Teachers' Self-efficacy in Secondary Schools of Kisumu County, Kenya" that it was found to have significant influence in the classroom management of teacher's self-efficacy in favor of single teacher.
Contrary to the reports and findings on classroom management and instructional strategies of teachers' teaching self-efficacy, another facet, the student engagement reveals a different result. Presented also in Table 2 , the mean score result of 7.23 and standard deviation of 1.27 of single teachers and a mean of 7.35 with standard deviation of 1.15 of married teachers grouped accordingly, generally implies a fair difference in the mean score and collectively can be describe both statistically as "high".

This displayed similar level of self- efficacy in student engagement. Married teachers are more engaged with students learning. Ascertain by Munini (2010) cited in Pianta (2012), Harbour (2015) and Oganda,

Raburu and Aloka (2015) studies that teachers' self-efficacy shows a positive influence in favor of married teachers when student engagement is taken into account.

On the length of service and level of teachers' teaching self-efficacy across the three facets, respondents are grouped as shorter and longer years in teaching experience obtained M=7.30 and SD=1.21; M=7.34 and SD=1.16

in student engagement, M=7.33 and SD=1.12 ; M=7.63 and SD=0.89 in instructional strategies and M=7.27 and SD=1.20; M=7.27 and SD=0.93 in classroom management and were interpreted collectively as "High" (M=7.30 and SD=1.17) for teachers with shorter years in teaching and "Very High" (M=7.41 and SD=1.01) with longer years in teaching experience. This finding shows a marked deviation with respondents having longer teaching experience. Analysis of data also shows that science teachers in both group reflects same result in student engagement and classroom management, though slight difference is observed in the mean scores and standard deviation.

Literature that showed similar results are Woolfolk Hoy and Spero (2005) conducted a longitudinal study which collected a data that claims significant rise in the self-efficacy after training. The same result shown in Wolters and Daugherty (2007) study were their modest effects on self-efficacy when instructional strategies are concern. According Protheroe (2008) one important factor that determines sense of self-efficacy is the experience. Woolfolk Hoy (2000) affirms that the most powerful influence in the development of the teachers' teaching self-efficacy is the mastery experience. Using also the mean and standard deviation results, Table 2 presents when grouped according to the education preparation that is education graduates and non-education graduates, the level of teachers' teaching self- efficacy varies as a whole. It was found that science teachers who are education graduates with specialized fields such as general science, biology, chemistry and physical science is "High" obtaining a mean score of 7.30 and standard deviation of 1.12. This finding is comparatively lower than those science teachers who graduated in Arts and Sciences and or other fields. The obtained mean results of the non- education graduates is "Very High" (M=7.62 and SD=1.05) collectively and is also "Very High" (M=7.94 and SD= 0.95) when measured individually and focused on the student engagement. Furthermore, findings revealed that both grouped observably to obtained "Very High" results (M=7.41 and SD=1.04; M=7.60 and SD=1.06) when instructional strategies of teaching self-efficacy is measured and "High" (M=7.26 and SD=1.11; M=7.62 and SD=1.05) in classroom management. Subsequently, when education graduate grouped is analyzed according to the level of self-efficacy in student engagement obtained mean score is "High" (M=7.22 and SD=1.19). Garancho and Marpa (2012) revealed same result considering faculty members' educational attainment disclosed that self-efficacy of the faculty can be influenced by their educational attainment. Researches show that a certain amount of efficacy doubt benefits teachers' learning of new practices required by educational reform (Wheatley, 2002).

Results of the present study on training of teachers however was confirmed by Clark and Bates (2003) that schools with highly developed professionals support and reinforce skills and efficacy beliefs. This elaborates teachers training and professional development enhances teachers' effectiveness. Lumpe, Vaughn, Henrikson and Bishop (2014) contested that teacher's belief system is improved by the teachers' professional development. Teachers with high regard to his or her work affects one's effectiveness as a whole.

Level of Teaching Proficiency of the Science Teachers when Grouped and Compared according to aforementioned Variables

Statistical analysis of the data in Table 3 revealed that the teaching proficiency level of the science teachers, when taken as a whole, is "Highly Proficient" with a mean score of 4.03 and standard deviation of 0.68. Examination of the data in the table, however, also showed that the level of teaching proficiency of the respondents varies in planning (M=3.85 and SD=0.69), development (M=4.08 and SD=0.69) and a result (M=4.01 and SD=0.65). These differences as shown in the mean and standard deviation reflect that when taken altogether teachers' proficiency is considerably high.

Consequently, this shows that teaching proficiency among science teachers with different demographic profile obtained relatively similar mean result and that explains positive monotonous results. This may imply that when science teachers have clearer set of goals, substantiated with content knowledge and innovative techniques increases students' achievement, thus, view as effective teacher (Darling-Hammond, 2000). Tucker and Stronge (2005) as cited in the goal of the National Commission on Teaching and America's Future (2006) asserts that if teachers do, competent and caring, it will make a difference in the student learning.

Table 3 Teaching Proficiency Levels of the Science Teachers when grouped and compared according to Age, Sex, Civil Status, Length of Service and Number of Hours in Training Attended

Differences in the Level of Scientific Literacy of the Science Teachers

Categories	Planning			Development			Result			As a Whole		
		SD	Int		SD	Int		SD	Int		SD	Int
Age												
Younger	3.74	0.67	HP	4.06	0.70	HP	3.95	0.62	HP	3.99	0.68	HP
Older	4.00	0.69	HP	4.10	0.67	HP	4.10	0.68	HP	4.09	0.67	HP
Sex												
Female	3.79	0.67	HP	4.09	0.70	HP	4.01	0.65	HP	4.03	0.69	HP
Male	4.08	0.73	HP	4.03	0.65	HP	4.03	0.67	HP	4.04	0.67	HP
Civil Status												
Single	3.92	0.54	HP	4.21	0.61	HP	4.02	0.54	HP	4.12	0.59	HP
Married	3.83	0.74	HP	4.03	0.71	HP	4.01	0.69	HP	3.99	0.71	HP
Length of Service												
Shorter	3.77	0.69	HP	4.07	0.70	HP	3.95	0.64	HP	3.99	0.69	HP
Longer	4.00	0.67	HP	4.10	0.66	HP	4.12	0.65	HP	4.09	0.66	HP
Undergraduate Preparation												
Education	3.80	0.68	HP	4.06	0.69	HP	4.00	0.65	HP	4.01	0.69	HP
Non-Education	4.17	0.62	HP	4.17	0.63	HP	4.10	0.61	HP	4.15	0.63	HP
Training												
Less	3.71	0.63	HP	4.04	0.69	HP	3.92	0.60	HP	3.97	0.68	HP
More	3.99	0.72	HP	4.11	0.69	HP	4.11	0.68	HP	4.09	0.78	HP
As a Whole	3.85	0.69	HP	4.08	0.69	HP	4.01	0.65	HP	4.03	0.68	HP

Theresultsoft-testforindependentofmeanstodeterminethesignificantdifferencesamongthe levelofscientificliteracyofscienceteacherswhengroupedaccordingtoage, sex, civil status, educational attainment, length of service and number of hours of training attended are presented in Table 4.

Table 4 Comparative Statistics in the Level of Scientific Literacy when grouped according to Age, Sex, Civil Status, Educational Attainment, Length of Service and Number of Hours of Training Attended

Categories	Mean	SD	p-value	Decision	Significance @ a = 0.05
Age					
Younger	11.96	4.19	0.41	Do not reject Ho	Not Significant
Older	10.94	3.67			
Sex					
Female	11.24	3.90	0.42	Do not reject Ho	Not Significant
Male	12.56	4.25			
Civil Status					
Single	13.42	3.92	0.06	Do not reject Ho	Not Significant
Married	10.77	3.78			
Length of Service					
Shorter	11.58	4.23	0.91	Do not reject Ho	Not Significant
Longer	11.44	3.60			
Undergraduate Preparation					
Education	11.10	3.79	0.09	Do not reject Ho	Not Significant
Non-Education	14.30	3.40	0.09	Do not reject Ho	Not Significant
Training					
Less	12.38	4.27	0.16	Do not reject Ho	Not Significant
More	10.67	3.51			

Table 4 shows the descriptive statistics of the respondents on significant difference in the level of scientific literacy when taken as a whole and when aforementioned variables were taken individually, significant differences was observed. A marked difference of their obtained mean scores was noted. This is supported by the obtained mean scores with probability values of 0.14, 0.42, 0.06, 0.91, 0.09 and 0.16, respectively. Since the obtained probability values are higher than 0.05 alpha level of significance, hypothesis which states that there is no significant difference in the level of scientific literacy of science teachers as a whole is therefore accepted.

Results presented in this regard reflect that science teachers did not differ significantly in the level of scientific literacy. This can be taken to mean that levels of scientific literacy of science teachers have no greater impact shown as in terms of scientific understanding with regards to the variables selected. When individual variable such as civil status and undergraduate preparations is discussed and interpreted, the obtained p - value is 0.06 and 0.09 respectively, which is higher than the 0.05 level of significance means that there is no significant difference in the level of scientific literacy among science teachers although it conforms with the findings of Brown and Graf (2013) on marital status towards financial literacy, singles have a significant propensity to lower financial literacy levels, when compared to married individuals. No studies and literature that recommend of significant differences altogether.

Differences in the Level of Teachers' Self- Efficacy of the Science Teachers

The results of t-test for independent of means to determine the significant differences among the level of teaching self- efficacy of science teachers when grouped according to

age, sex, civil status, educational attainment, length of service and number of hours of training attended are presented in Table 5 and 6.

The significant difference of science teachers in student engagement a facet of self- efficacy is discussed, the p-value obtained is 0.96, 0.15, 0.42, 0.80 and 0.85, respectively. Hence, the p-value of the selected variables in table 5 shows a high degree of probability value compared to the 0.05 alpha level of significance, it is said to be that the null hypothesis is true and therefore it is accepted except in undergraduate preparation which is rejected. Thus, there is no significant difference in the level of Self- efficacy in student engagement among teachers when grouped according to the aforementioned variables.

This finding means that the level of self-efficacy in student engagement shows no vast difference when variables are taken individually. Premise studies conducted that school teachers have almost the same self- efficacy (Pelaez 2013), although it was observed in an old adage of time that in sexes, female usually is more attentive and more efficient, where in males can equate the same (Ghaith and Shaabah (1999). Abubakar and Aguguo (2011), Ejimaji and Emekene (2012) revealed the same result that age was insignificant. More to these studies revealed that gender, age, grade level taught, education, training attended were not found related to the teachers' perception of self- efficacy of any teaching categories.

Table 5 also show the result and findings of obtained p - value in the degree of significant difference in teachers' self- efficacy when instructional strategies is taken into context. As shown in the table 5, the obtained p- value of age, sex, civil status, length of service, education preparation and training attended are 0.04, 0.08, 0.97, 0.01, 0.25 and 0.06 respectively.

Table 5 Comparative Statistics in the Level of Teaching Self- efficacy in Student Engagement and Instructional Strategies and when grouped according to Age, Sex, Civil Status, Educational Attainment, Length of Service and Number of Hours of Training Attended

Categories	Student Engagement					Instructional Strategies				
		SD	p-value	Decision	Significance @ α = 0.05		SD	p-value	Decision	Significance @ α = 0.05
Age										
Younger	7.31	1.17	0.96	Do Not Reject H_o	Not Significant	7.34	1.13	0.04	Reject H_o	Significant
Older	7.32	1.21				7.57	0.91			
Sex										
Female	7.27	1.17	0.15	Do Not Reject H_o	Not Significant	7.33	1.06	0.08	Do Not Reject H_o	Not Significant
Male	7.50	1.23				7.63	0.38			
Civil Status										
Single	7.23	1.27	0.42	Do Not Reject H_o	Not Significant	7.44	1.13	0.97	Do Not Reject H_o	Not Significant
Married	7.35	1.15				7.44	1.01			
Length of Service										
Shorter	7.30	1.21	0.80	Do Not Reject H_o	Not Significant	7.33	1.12	0.01	Do Not Reject H_o	Significant
Longer	7.34	1.16				7.63	0.89			
Undergraduate Preparation										
Education	7.22	1.19	0.00	Reject H_o	Significant	7.41	1.04	0.25	Do Not Reject H_o	Not Significant
Non-Education	7.92	0.95				7.60	1.06			
Training										
Less	7.33	1.19	0.85	Do Not Reject H_o	Not Significant	7.33	1.16	0.06	Do Not Reject H_o	Not Significant
More	7.30	1.19				7.55	0.91			

When indicators of self-efficacy were considered individually, indicators such as sex, civil status, education preparation and number of hours training attended showed an obtained p - value of 0.08, 0.97 and 0.25 that is greater than 0.05 alpha level of significance. In this regard, hypothesis which states that there is no significant difference in the level of teachers' self-efficacy in terms of instructional strategies domain when taken individually is therefore not rejected.

Statistical results also reveal that age and length of service shows lesser p - value of 0.04 and 0.01 than the standard p - value of 0.05 alpha level of significance. It can be inferred that the hypothesis which states that there is no significant difference in the level of science teachers' self- efficacy in instructional strategies is in focus, when grouped according to age and length of service is therefore

rejected. This means that younger and older respondents in term of age and lesser and longer stay in service do differ significantly in the level of self-efficacy in terms of efficacy in instructional strategies.

This comes to a discussion between different researchers that point out different perspectives towards self-efficacy. Pelaez (2013) once noted that older teacher excels at work naturally. Peterson (2013) believes that under different condition over time, body of knowledge increases both his performance and self- efficacy. Teacher's self-efficacy basically is influence by age and years of experience. According to Moran and Woolfolk Hoy (2000) it is not surprising that novice teachers obtained lower scores because of their inexperience in teaching.

Comparative Statistics in the Level of Teaching Self- efficacy in Classroom Management and as a Whole and when Grouped according to Age, Sex, Civil Status, Educational Attainment, Length of Service and Number of Hours of Training Attended

Categories	Classroom Management					As a Whole				
		SD	p-value	Decision	Significance @ α = 0.05		SD	p-value	Decision	Significance @ α = 0.05
Age										
Younger	7.30	1.21	0.60	Do Not Reject H_o	Not Significant	7.32	1.17	0.41	Do Not Reject H_o	Not Significant
Older	7.24	0.94				7.38	1.03			
Sex										
Female	7.25	1.14	0.38	Do Not Reject H_o	Not Significant	7.30	1.13	0.02	Reject H_o	Significant
Male	7.36	1.10				7.50	1.06			
Civil Status										
Single	7.45	1.14	0.07	Do Not Reject H_o	Not Significant	7.37	1.18	0.61	Do Not Reject H_o	Not Significant
Married	7.20	1.08				7.33	1.09			
Length of Service										
Shorter	7.27	1.20	0.97	Do Not Reject H_o	Not Significant	7.30	1.17	0.11	Do Not Reject H_o	Not Significant
Longer	7.27	0.93				7.41	1.01			
Undergraduate Preparation										
Education	7.26	1.11	0.66	Do Not Reject H_o	Not Significant	7.30	1.12	0.00	Reject H_o	Significant
Non-Education	7.33	1.05				7.62	1.05			
Training										
Less	7.30	1.25	0.66	Do Not Reject H_o	Not Significant	7.32	1.20	0.52	Do Not Reject H_o	Not Significant
More	7.24	0.94				7.37	1.03			

Presented in Table 6, reflects the computed p - value of age (0.60), sex (0.38), civil status (0.07), Length of service (0.47), Education preparation (0.66) and number of hours training attended (0.66) in classroom management of teachers' self-efficacy.

The computed p - value of the selected variables show higher test value when compared to the standard probability value of 0.05 alpha.

This result indicates that there is no significant difference in the teachers' self-efficacy among science teachers when grouped according to age, sex, civil status, length of service, education preparation and number of hour training attended. Hence, the statement of hypothesis which stated that there is no significant difference in the level of teachers' self-efficacy in classroom management when grouped according to the above variables is not rejected.

Therefore, the selected variables do not influence teachers' self-efficacy in classroom management. In contrary to Yilmaz and Cavas (2008) study reported there is a change in teachers' self-efficacy in classroom management with time whether the teacher had changed marital status or not. This is somewhat accepting to Hicks (2012) analyzed how classroom management, teacher age, and self-efficacy levels were related.

Moreover, the data in Table 6 show a statistical description of result when level of significant difference of science teachers' self-efficacy is taken as a whole.

The results poses divided results of significant differences exist in the level of teachers' self-efficacy among science teacher respondents when aforementioned variables are taken individually and in a grouped.

Furthermore, data presents that the computed p - value of age (0.41), civil status (0.61), length of service (0.11) and number of hours training attended (0.52) taken collectively displays a higher value than the test value at 0.05 level of significance. This result indicates that there is no significant difference in the level of teachers' self-efficacy among science teacher respondents when variables are taken in a grouped. This can be taken to mean that the whether it's an older or younger, married or single, with longer work experienced or less trained teachers or untrained does not show any difference when the level of self- worth and belief is given into consideration. This concludes that the null hypothesis that states there is no significant difference level of science teachers' self-efficacy when they are grouped and compared according to age, civil status, years of service and number of hours training attended is therefore not rejected.

These findings have been echoed in more recent research shows no significant relationship between age, levels of self-efficacy (Hoy & Tschannen-Moran, 2007; Voris, 2011) and marital status (Tella 2003 and Pajares 2006). But not to Adio and Popoola (2010) result show there is a significant relationship between gender, age, marital status, number of years spent in the library and career commitment of librarians in federal university libraries in Nigeria.

Results in table 6 also denotes that computed p - value of 0.02 (sex) and 0.00 (educational attainment) that is deemed lower that the standard p - value of 0.05 alpha level of significance is considerably significant. It was hypothesized that the level of teachers' self- efficacy when taken as a whole and when grouped according to aforementioned variables would not be significant. Therefore, as to the findings of the current study that performed a statistical analysis, the null hypothesis is rejected.

Ferara (2013) conducted a study in United States and Bututcha (2013) in Ethiopia found that there is significant differences between male and female self- efficacy. Results in this regard, conform to the experiment conducted by Voris (2011) analyzed the role that teacher efficacy, job satisfaction, age, and other demographic variables play in the self-efficacy of early career special education teachers.

Differences in the Level of Teaching Proficiency of the Science Teachers

As shown in table 7, the data revealed that there is a significant difference in the computed p - value of age (0.02), sex (0.03), length of service (0.03), undergraduate preparation (0.01) and training (0.01) as it shows significantly lesser than the probability value of 0.05 alpha level of significance. This explains an observable difference in the p-value. Thus, hypothesis which states that there is no significant difference in the level of teaching proficiency of science teachers when they are grouped into planning and when compared according to aforementioned variables is therefore rejected.

Table 7 Comparative Statistics in the Level of Level of Teaching Proficiency in Planning and Development When Grouped according to Age, Sex, Civil Status, Educational Attainment, Length of Service and Number of Hours of Training Attended

Categories	Planning					Development				
		SD	*P*-value	Decision	Significance @ α = 0.05		SD	*P*-value	Decision	Significance @ α = 0.05
Age										
Younger	3.74	0.67	0.02	Reject H_o	Significant	4.06	0.70	0.38	Do Not Reject H_o	Not Significant
Older	4.00	0.69				4.10	0.67			
Sex										
Female	3.79	0.67	0.03	Reject H_o	Significant	4.09	0.70	0.33	Do Not Reject H_o	Not Significant
Male	4.08	0.73				4.03	0.65			
Civil Status										
Single	3.92	0.54	0.38	Do Not Reject H_o	Not Significant	4.21	0.61	0.00	Reject H_o	Significant
Married	3.83	0.74				4.03	0.71			
Length of Service										
Shorter	3.77	0.69	0.03	Reject H_o	Significant	4.07	0.70	0.52	Do Not Reject H_o	Not Significant
Longer	4.00	0.67				4.10	0.66			
Undergraduate Preparation										
Education	3.80	0.68	0.01	Reject H_o	Significant	4.06	0.69	0.13	Do Not Reject H_o	Not Significant
Non-Education	4.17	0.62				4.17	0.63			
Training										
Less	3.71	0.63	0.01	Reject H_o	Significant	4.04	0.69	0.19	Do Not Reject H_o	Not Significant
More	3.99	0.72				4.11	0.69			

However, data collected in the table 7 also reveals that among the indicators that shows significant difference in the teaching proficiency of science teachers, civil status does not show any disparity as shown in the a computed p-value of 0.38 that is greater than the probability value of 0.05 alpha level of significance. Hence, the hypothesis which states that there is no significant difference in the level of teaching proficiency of science teachers when they are grouped into planning and when compared individually to the civil status alone is therefore not rejected.

Results presented in this table indicate that difference in the obtained mean gain, obtained p - value of the level of teaching proficiency in planning is in favor of age, sex, length of service, undergraduate preparation and training attended of science teachers and less favorable to the marital status of the science teachers. Therefore, it is revealed that teachers' age, years of teaching experience, teacher gender, and the undergraduate education of a teacher play a significant role and that it greatly influences the teaching proficiency of teachers.

The findings concur with the results of the investigation conducted by Mison and Bernabe, (2004) that demographic profile such as age, sex, marital status, and tenure influence employee performance. To boot relationship between ages and work performance, aging declines work proficiency. With age, marital commitment and experience teachers come to a variety of possibilities that boost self- esteem and increases responsibility (Tim Khlai, 2006). Labadia (2010) also affirm demographic variables as age and length of service negatively correlates job satisfaction and job effectiveness but positively career satisfaction.

As to teaching proficiency that focus on the Development, the computed p-value of 0.38 (age), 0.33 (sex), 0.52 (length of service), 0.13 (undergraduate preparation) and 0.19 (training) is also shown in Table 7. This result means that the level of teaching proficiency particularly in development of younger and older, male or female, shorter or longer teaching experiences and education preparation of the respondents do not differ significantly when compared to the test value of 0.05 alpha level of significance. Moreover, the obtained mean scores in civil status had shown a computed p - value of 0.00 which is less than the 0.05 alpha level of significance. Thereby, null hypothesis that states that there is no significant difference in the level of teaching proficiency of science teachers when they are grouped into development and when compared according to aforementioned variables is therefore rejected. This applies when teachers are grouped according to civil status is observed.

Results presented in this regard reflect that science teachers teaching proficiency level in development does not differ significantly when grouped according to age, sex, length of service, undergraduate preparation and number of hours training attended but not in their civil status. This can be taken to mean that the response of the respondents shows no consistent evidence that supports demographic profile significant influence in teaching proficiency in terms of development. Although shows relevance in civil status. Findings of the study conducted by Rakumaku (2010) negates the current study, in view of profiling teachers in mathematics older, more experienced teachers are found in urban schools are better qualified - academically and professionally with comparatively limitless experience in teaching and viewed to be developed and carry out classroom responsibilities effectively.

Along with the claims towards teaching proficiency, teachers must execute and carry out the activities clearly demanded by the curriculum to achieve success in teaching learning process and produce highly competitive learners regardless of demographic differences (Usod and Kadtong 2013).

Table 8 Comparative Statistics in the Level of Level of Teaching Proficiency in Results and As a Whole and When Grouped according to Age, Sex, Civil Status, Educational Attainment, Length Of Service And Number Of Hours Of Training Attended

Categories	Results					As a Whole				
		SD	p-value	Decision	Significance @ α = 0.05		SD	p-value	Decision	Significance @ α = 0.05
Age										
Younger	3.95	0.62	0.04	Reject H_o	Significant	3.99	0.68	0.01	Reject H_o	Significant
Older	4.10	0.68				4.09	0.67			
Sex										
Female	4.01	0.65	0.81	Do Not Reject H_o	Not Significant	4.03	0.69	0.79	Do Not Reject H_o	Not Significant
Male	4.03	0.67				4.04	0.67			
Civil Status										
Single	4.02	0.54	0.85	Do Not Reject H_o	Not Significant	4.12	0.59	0.00	Reject H_o	Significant
Married	4.01	0.69				3.99	0.71			
Length of Service										
Shorter	3.95	0.64	0.03	Reject H_o	Significant	3.99	0.69	0.02	Reject H_o	Significant
Longer	4.12	0.65				4.09	0.66			
Undergraduate Preparation										
Education	4.00	0.65	0.36	Do Not Reject H_o	Not Significant	4.01	0.69	0.01	Reject H_o	Significant
Non-Education	4.10	0.61				4.15	0.63			
Training										
Less	3.92	0.60	0.01	Reject H_o	Significant	3.97	0.68	0.00	Reject H_o	Significant
More	4.11	0.68				4.09	0.78			

Relevant research results are found to be equivocal at best, implying that the relationship between varying demographics towards teachers teaching performance is quite complex. Corbett, Wilson and Williams (2005) concur to this finding that ethnicity, socioeconomic status, and gender contributes to the longstanding achievement gaps. Related findings made by Alufohai and Ibhafidon (2015) that teachers' age and teachers' marital status significantly influenced students' academic achievement in English language. This further discussed the facts that age comes into exhaustion that cause inefficiency after staying longer in the service, but can be contained when progressive intervention has spent.

Likewise, Arbuckle and Williams (2003) believe that male teachers asserting authority during teaching is a significant characteristic and is influencing. For Mwamwenda and Mwamwenda (2002), female teachers teach better in English Language, Mathematics, Science and Social studies in Botswana and

Zuzovsky (2003) in Israel. This is also confirmed by recent research conducted by Ali, et al (2013) that stresses age significantly influences academic performance of students.

Relationship of Science Teachers Scientific Literacy, Teaching Self- Efficacy and Teaching Proficiency

Table 9 Relationship of Science Teachers Scientific Literacy, Teaching Self-Efficacy and Teaching Proficiency

		Scientific Literacy	Self-Efficacy	Teaching Proficiency
Scientific Literacy	Sig. (2-tailed)		0.11	-0.21
	N	42	42	42
Self-Efficacy	Sig. (2-tailed)	0.11		0.50
	N	42	42	42
Teaching Proficiency	Sig. (2-tailed)	-0.21	0.50	
	N	42	42	42

The table shows that when science teachers levels of scientific literacy compared to the teachers' self-efficacy (p - value = 0.11) and teaching proficiency (p - value=-0.21) the data reveals no positive relation. Comparatively done with self-efficacy towards scientific literacy (p = 0.11) and teaching proficiency (p=0.50) that reveals the same. Moreover, when science teachers teaching proficiency is correlated to the level of scientific literacy (p = -0.21) and Teachers' self-efficacy (p =0.50) similar results were obtained.

Based on the explication of data, the table shows a negative relationship among science teachers' scientific literacy, teaching self-efficacy and teaching proficiency hence the obtained computed probability value (p - value) is observably lesser than the testing p- value of 0.05 alpha level of significance.

Result of the study tangentially negates with the researches that the self- efficacy of teachers is significantly positively related to classroom technology use by teachers This mean that teachers self-efficacy improves teachers' performance at school. A study conducted by Jinks and Morgan (1997) in Tschannen- Moran (2009) shows correlation between science performance and the overall scale of self-efficacy is also positive and significant. Correspondingly, Haney, Wang, Keil and Zoffel (2007) also suggests that teacher's participation in implementation of new instructional practices positively raises self-efficacy. Conclusively, Laaksonen (2009) directs science knowledge, science-related self-efficacy and self-concepts are highly significant to the success of the science learning and teaching and learning performance. Above all, teacher's attitude and beliefs about their ability to respond and meet the challenge of teaching task were shaped by the rich content-knowledge and innovation of teachers to improve instructional resources, provide specific resources for organizational expectations and classroom goals.

SUMMARY OF FINDINGS

The following are the findings of the study:

The level of scientific literacy of the science teachers when taken as a whole and when grouped according to the selected variables was basic except on non-education graduates which is high.

On the other hand, the level of science teachers' self- efficacy when taken as a whole and when grouped according to age, civil status, and training is high. However, when grouped according to sex, the level of teachers' self- efficacy of male science teacher self-efficacy was very high while those of the females were high. Likewise, when grouped according to length of service, the level of science teacher's self-efficacy with shorter length of service was high but very high for those with longer length of service. Furthermore, education graduate science teachers' level of self-efficacy was high while those with non-education graduates are very high.

Furthermore, findings indicate that the teaching proficiency of science teachers was highly proficient when taken as a whole and when grouped according to the selected variables. Likewise, the same results were observed when teaching proficiency in terms of planning, development, and result was considered.

Considering significant difference in the level of scientific literacy of the science teachers, results show that there is no significant difference in the level of the scientific literacy of the science teachers when grouped according to age, sex, civil status, length of service, undergraduate preparation, and training.

In terms of science teacher's teaching self-efficacy, results disclosed that there is no significant difference in the level of teaching self-efficacy of science teachers when grouped according to age, civil status, length of service, and training. However, significant differences were observed when science teachers were grouped according to sex, and undergraduate program. Furthermore, results also show that there is no significant difference in the level of science teachers teaching self-efficacy when grouped according to the selected variable except when they are grouped according to undergraduate program. Likewise, in terms of instructional strategies except when they are grouped according to age. However, in terms of classroom management, no significant difference was observed when science teachers were grouped according to the selected variables.

Furthermore, findings revealed that there is a significant difference in the level of the teaching proficiency of the science teachers when taken as a whole except when they are grouped according to sex. However, when dimension was considered individually, there is a significant difference in the level of science teachers teaching proficiency in terms of planning except when they are grouped according to civil status. However, in terms of development no significant differences were observed except when they are grouped according to civil status.

Lastly, result indicates that there is no significant correlation among science teachers' scientific literacy, self-efficacy, and teaching proficiency.

CONCLUSIONS

Based on the foregoing findings, it was deduced that science teachers were not able to develop scientific literacy as a whole and when grouped according to the selected variables. However, science teachers who are not education graduates have already developed their scientific literacy.

This study also concludes that science teachers do not differ significantly in the level of their scientific literacy when grouped according to age, sex, civil status, length of service, undergraduate preparation, and training. This means that the level of their scientific literacy is almost the same.

Furthermore, scientific teachers when taken as a whole and when grouped according to the selected variables were proficient enough in teaching the subjects. They already have mastery of the subject matter. They used appropriate teaching strategies and techniques in teaching the different areas of science and they know how to manage their classrooms. It is believed that he or she has

the ability to engage in a task and accomplish it.

Likewise, science teachers do not differ significantly in the level of teaching self-efficacy when grouped according to age, civil status, length of service, and training. The level of their teaching efficacy in this regard is almost the same. However, male and female science teachers differ significantly in the level of their self-efficacy.

Science teachers differ significantly in the level of their teaching proficiency when taken as a whole and when grouped according to the selected variables except when they are grouped according to sex. Males have better teaching proficiency than females.

Lastly, the study concludes that no relationship existed among science teachers' scientific literacy, self-efficacy, and teaching proficiency.

Based on the foregoing findings, it was deduced that science teachers were not able to develop scientific literacy as a whole and when grouped according to the selected variables. However, science teachers who are not education graduates have already developed their scientific literacy.

RECOMMENDATIONS

In the light of the foregoing findings and conclusions, the following are the courses of actions and recommendations submitted by the researcher:

The study recommends that administrators must review, initiate and plan programs in strengthening and deepening scientific and technological skills of the teachers

as mandated in the K-12 curriculum. Further, it is recommended to address the need to enhance and develop more Science teachers' content - knowledge to provide a well-deserved learning outcome as expected by the Department of Education.

Teachers are encouraged to assess their scientific skills, pedagogical knowledge in understanding critical science in order to divulge deeper in improving learning exercises and enrichment activities that developed the utmost scientific ability of the student. Likewise, enhance scientific skills through updating and attending seminars or post-graduate studies in line with the specialized fields to maximize learning. It was cited in various studies that teachers obtained lowest scientific literacy and does greatly influence academic performance of the students.

Teachers' age, civil status, education and training should also be considered as determinants in screening and hiring teacher applicants and as variable in teaching, as this contributes in the teaching techniques, strategies, methods and procedures.

Moreover, teachers are encouraged to participate, and engaged in specific activity like in-service program that includes motivational activities that focuses on the discussion of the character building, essence of professionalism to enhance not only the teaching skills but to create a positive environment that improves and develop pride among teachers.

It is also recommended to engage into peer-to-peer activity or feedback session in order to enrich performance efficiently and effectively and senior teachers (older, longer in service and specialized education and training) can be a potential material to become a peer consultant or human resource. It can be noted that teachers' efficacy and teaching proficiency influence the essence of one's belief to be successful.

Junior high school students are encouraged to equipped and develop critical and scientific thinking. It is believed that students' acquisition of scientific knowledge does not only improve basic learning but to be able to use the scientific skills advances them to be totally literate citizen.

Training institutions should ensure adequate relevant content-based training of teacher-

trainees that will increase the scientific skills and confidence level of science teachers as they taught deeper the nature of science. Moreover, factor like hands-on workshops may be looked into as they may be factors to predict high scientific literacy and positive teaching performance. Curriculum planners should revisit and review the curriculum guide to realign it to the teachers and learners guide that Science teachers and students are dependent on regularly basis in order to meet the expected outcomes.

Future researchers can conduct a similar study using variables other than sex, age, civil status, length of service, undergraduate education and training attended as well as conduct a similar study in other city schools' division to further confirm or deny the present study.

In the light of the foregoing findings and conclusions, the following are the courses of actions and recommendations submitted by the researcher:

The study recommends that administrators must review, initiate and plan programs in strengthening and deepening scientific and technological skills of the teachers as mandated in the K-12 curriculum. Further, it is recommended to address the need to enhance and develop more Science teachers' content - knowledge to provide a well-deserved learning outcome as expected by the Department of Education.

Teachers are encouraged to assess their scientific skills, pedagogical knowledge in understanding critical science in order to divulge deeper in improving learning exercises and enrichment activities that developed the utmost scientific ability of the student. Likewise, enhance scientific skills through updating and attending seminars or post-graduate studies in line with the specialized fields to maximize learning. It was cited in various studies that teachers obtained lowest scientific literacy and does greatly influence academic performance of the students.

Teachers' age, civil status, education and training should also be considered as determinants in screening and hiring teacher applicants and as variable in teaching, as this contributes in the teaching techniques, strategies, methods and procedures.

Moreover, teachers are encouraged to participate, and engaged in specific activity like in-service program that includes motivational activities that focuses on the discussion of the character building, essence of professionalism to enhance not only the teaching skills but to create a positive environment that improves and develop pride among teachers.

It is also recommended to engage into peer-to-peer activity or feedback session in order to enrich performance efficiently and effectively and senior teachers (older, longer in service and specialized education and training) can be a potential material to become a peer consultant or human resource. It can be noted that teachers' efficacy and teaching proficiency influence the essence of one's belief to be successful.

Junior high school students are encouraged to equipped and develop critical and scientific thinking. It is believed that students' acquisition of scientific knowledge does not only improve basic learning but to be able to use the scientific skills advances them to be totally literate citizen.

Training institutions should ensure adequate relevant content-based training of teacher-trainees that will increase the scientific skills and confidence level of science teachers as they taught deeper the nature of Science. Moreover, factor like hands-on workshops may be looked into as they may be factors to predict high scientific literacy and positive teaching performance.

Curriculum planners should revisit and review the curriculum guide to realign it to the teachers and learners guide that Science teachers and students are dependent on regularly basis in order to meet the expected outcomes.

Future researchers can conduct a similar study using variables other than sex, age, civil status, length of service, undergraduate education and training attended as well as conduct a similar study in other city schools' division to further confirm or deny the present study.

REFERENCES

ADB. (2011). Republic of the Philippines: Education Improvement Sector Development Program.

ADB. (2013). Country Operations Business Plan: Philippines 2014-2016: Sector Assessment (Summary): Education, pp. 6-7 Retrieved from: http:// goo.gl/6JKI6Q

Adio, G. (2011). Demographic Variables and Self-Efficacy As Factors Influencing Career Commitment to Librarians in Federal University Libraries in Nigeria. Aktaú, M., Kurt, H., Aksu, Ö. & Ekic, G. (2013). Gender and experience as predictor of biology teachers' education process self-efficacy perception and perception of responsibility from student success.

International Journal on New Trends in Education and Their Implications, Volume 4, Issue 3: 37 – 47.

Al-GZu'bi, Z. H. (2013). Classroom management problems among teacher students training at Hashemite University. European Journal of Business and Social Sciences, Vol. 2, No. 3: 140 – 149.

Alufohai, P.J., Ibhafidon, H. (2010) Influence Of Teachers' Age, Marital Status And Gender On Students' Academic Achievement. Department Of Curriculum And Instruction, Faculty Of Education, Ambrose Alli University Ekpoma, Nigeria

American Association for the Advancement of Science (1989 a) Project 2001: Science for all Americans. Washington D.C. AAAS.

American Association for the Advancement of Science (1989 b) A Project 2061 Panel Report: Technology. Washington D.C. AAAS.

American Psychological Association (APA, 2011). The guidelines for psychological practice with lesbian, gay and bisexual clients. Retrieved on 24th Februay 2017 from http://www.apa.org/pi/lgbt/ resources/ guidelines.aspx

Andersen, G., (2011). Teacher diversity: Do male and female teachers have different self-efficacy and job satisfaction? Department of Political Science, Aarhus University & Danish Institute of Governmental Research lotte@ps.au.dk

Andersen, L. B. (2011). Teacher diversity: Do male and female teachers have different self-efficacy and job satisfaction? European Group for Public Administration (EGPA). Retrieved on 23rd February 2017 from https://soc.kuleuven.be/io/egpa/ HRM/bucharest/ Andersen2011.pdf

Arslan, A. (2013). Investigation of Relationship between Sources of Self-efficacy Beliefs of Secondary School Students and Some Variables. Educational Sciences: Theory & Practice - 13(4): 1983 – 1993.

Arbuckle, J. & Williams, B. D. (2003). Students Perceptive of experiences: age and gender effects on teacher's evaluation. Sex Roles, 49, 9-10.

Antoniou, A.-S., Polychroni, F., & Vlachakis, A.-N. (2006). Gender and age differences in occupational stress and professional burnout between primary and high- school teachers in Greece. Journal of Managerial Psychology, 21, 682– 690.

Ardianto, D., Rubini, B., Pursitasari, I. and Permana, I. (2014) Professional development model for science teachers based on scientific literacy. Science Education Study Program, Pakuan University, INDONESIA

Ayeop, A. B. (2000). Individual Characteristics and job satisfaction among secondary school teacher. Kubangpasu (unpunished mastersthus) University of Utara, Malaysia.

Baker, W. and Keller, J. (2010). Strengthening STEM education through authentic research experiences for preservice and early career teachers: Science Teacher and Researcher (STAR) Program: Association of American Colleges and Universities/ Peer Review: Spring 2010 Vol.12, No.2: Retrieved from: http://goo. gl/L3ciFM

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan

(Eds.), Adolescence and education: Vol. 5. Self-efficacy and adolescence (pp. 307–337). Greenwich, CT: Information Age.

Bandura, A. (2000). Self-Efficacy: Foundation of Agency. In W.Perrig & A.Gorb (Eds.), Control of Human Behavior, Mental Processes, and Consciousness (pp. 17-33). Mahwaj, NJ: Lawrence Erlbaum. Bandura, A. (2001). Self.efficacy. Social Cognitive Thinking. [viewed 18 Oct 2016, verified 1 May 2007] http://www.emory.edu/ EDUCATION/mfp/BanEncy.

Bandura, A. (2005). The evolution of social cognitive theory. In K. G. Smith and M. A. Hitt (Eds). Great Minds in management (pp. 9). Oxford: Oxford University Press.

Bandura, A. (1995). Exercise of personal and Collective Efficacy in Changing Societies. In A. Banudra (Ed.), Self-efficacy in Changing aSocieties (pp,1-45) Cambrigde; Cmabrigde University Press.

Basilio, F. (2003). Fundamental Statistics. Philippines: Trinitas Publishing, Inc. p. 249.

Berito, M.(2014). Academic Engagement, Attitudes of Secondary Students towards Science III in the Division of Cadiz City School Year 2013-2014.

Bhanthumnavin, D. (2003). Perceived social support from supervisor and group members' psychological and situational characteristics as predictors of subordinate performance in Thai work units. Human Resource Development Quarterly, 14, 79-97.retrieved from: http://ir.library.louisville.edu/cgi/

Bobbett, J. (2001) School culture, teacher efficacy, and decision making in demonstrably effective and ineffective schools. Unpublished Doctoral dissertation, Louisiana State University

Bryan,L. (2012). Research on Science Teachers Beliefs. In B.J.T.Fraser, K. McRobbieJ. Campbell & J. Barry (Eds.) Second International Handbook in Science Education. Vol.24.New York Springer.

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, Volume 3, Number 2: 77 –101. Boston University School of Public Health (BUSPH, 2013). The Social Cognitive Theory. Behavioral Change Models. Retrieved on 3rd January 2017 from http://sphweb. bumc.bu.edu/otlt.html

Butucha, K. (2013). Gender and school type differences in self-efficacy in teaching. Sky Journal of Educational Research Vol. 1(4): 23 –31.

Butucha, K. (2014). Relationships between secondary school beginning teachers' perceptions of self- efficacy and professional commitment in thiopia. International Journal of Academic Research in Progressive Education and Development, Vol. 3, No. 3 (Special Issue), pp. 79 – 104.

Calmorin, L. and Calmorin, M. (2010). Research Methods and Thesis Writing. Metro Manila: Rex Book Store. pp. 70, 73.

Chand, T. (2006). Principles of teaching. Delhi, India: Anmol Publications Pvt. Ltd. pp 65-67, 194, 209-211. Chaplain, R. P. (2008). Stress and psychological distress among trainee secondary teachers in England. Educational Psychology, 28, 195–209.

Chaney, B. (1995). Student outcomes and the professional preparation of eighth grade teachers in science and mathematics. Rockville, MD: Westat.Retrieved from: hhtp://www.nap.edu/catalog/11625.html

Cheng, Y., and Ren, L. (2010). Elementary Resource Room Teachers' Job Stress and Job Satisfaction. Journal of Intellectual and Development Disability, p.44.9. Chow, B. W.-Y., Chiu, M. M., & Wong, S. (in press). Emotional intelligence, social problem solving skills, and psychological distress: A study of Chinese undergraduate students. Journal of Applied Social Psychology.

Cliflton, R., Kwong, J., and Wang, H. (2010). Rethinking our assumptions about teachers' job satisfaction in China and the West. Australian Journal of Educational Research, p.39.10.

Clotfelter, C.T., Ladd, H., and Vigdor, J. (2005). "Teacher- Student Matching and the Assessment of Teacher Effectiveness." Unpublished. Durham: Duke University.

Clough, G.W. (2012). Increasing Scientific Literacy. A shared Responsibility. Smithsonian Institution. Retrieved from:

Cobern, William W. (1996). Traditional Culture, Science, Technology and Development: Toward a new literacy for Science and Technology. A paper presented at the Tokyo Institute of Technology, Japan.

Damasco, E., (2013) Effects of supplementary instructional materials in Physics on the science process skills of the fourth year high school students of Caduha-an National High School during the School Year 2012- 2013.

Darling-Hammond, L (2000). Teacher quality and student achievement: A review of the state policy evidence. Education Policy Analysis Archives, 8 (1), 2–8.

Drake, C. (2002). Experience counts: Career stage and teachers' responses to mathematics education reform. Educational Policy, 16, 311–337

Ebert, E. II and Culyer, R. II. (2012). Introduction to Education. Singapore: Cengage Learning Asia Pte. Ltd. pp .20, 107-108, 113, 148, 171, 324.

Ejimaji, E., and Emekene, C. (2012). Sciene Teaching and Learning: Qualitative and functional chemistry education: Does gender and age affect academic achievement. Eurasian Journal of Physics and Chemistry Education, Jan (Special Issue): 33- 39.

Enochs,L., Scharmann,L., & Riggs,I. (1995). The Relationship of Pupil Control to E l e m e n t a r y Science Teacher Self-Efficacy and Outcome expectancy.Science education, 79.

European Commission. (2013). Supporting teacher competence for better learning outcome, pp. 41-43. Retrieved from: http://goo.gl/K6jIoH

European Commision Directorate- General for Education and Culture. (2013) PISA 2012: EU performance and first inferences regarding education and training policies in Europe, pp. 2, 8. Retrieved from: http:// goo.gl/fZiYtC

Ferrara, M. M. (2013). Is gender a factor in classroom management: Looking from within a single- gender classroom? American Association of Colleges for Teacher Education, New York. Retrieved on 3rd January 2015 from http://citation.allacademic.com/meta/p141507_index.html

Friedman, I.A. & Kass, E. (2002).Teacher Self-Efficacy: A Classroom- Organization Conceptualization. Teaching and Teacher Education,18,

Evans, L. (2001). Delving deeper into morale, job satisfaction, and motivation among education professionals. Educational Management and Administration, 29, 291–306.

Gates, G. S. (2007). Emerging thought and research on student, teacher,and administrative stress and coping. Greenwich, CT: Information Age.

Ghaith, G., & Yaghi, H. (1997). Relationships among experience, teacher efficacy, and attitudes toward the implementation of instructional innovation. Teaching and Teacher Education, 13, 451– 458.

G. Brawner (Eds.) Science education in the Philippines: Challenges for development (Vol.1) (pp.41-77). Manila, National Academy of Science and Technology. Goodrum, D. and Rennie, L. (2007). Australian School Science Education National Action Plan 2008-2012.

Canberra, ACT: Department of Education, Science and Training.

Goldhaber, D.D., and Brewer, D.J. (2000). Does teacher certification matter? High school teacher certification status and student achievement.Education Evaluation and Policy Analysis, 22(2), 129-145.Retrieved from: hhtp://www.nap.edu/catalog/11625.html

Guskey, T. (2002). Professional development and Teacher Change. Teachers and Teaching: Theory and Practice,8(3)

Harris, D. and Sass, R. (2007). Teacher training, teacher quality, and student achievement: Working Paper 3. ERIC

Hattie, J. (2003). Teachers make a difference: What is the research evidence? Background paper to presentation of ACER Research Conference.

Hill, C., Corbette, C., and St. Rose, A. 2010. Why So Few? Women in Science, Technology, Engineering and Mathematics. United States: AAUW. p. 27.Physics Today. American Institute of Physics. p. 40.

Huskin, P., M. Mundy and L. Kupczynski (2016). The Impact of Knowledge and Experience: Preservice Teachers' Perceived Sense of Efficacy and Perceptions of Inclusion of Students with Disabilities. Texas A&M University-Kingsville. Retrieved from: http://goo. gl/1VlWKo

ICSU. (2011). Report of the ICSU Ad- hocReview Panel on Science Education. International Council for Science, pp. 7-8. Paris. Retrieved from: http://goo.gl/NmRtj5 International

Technology Education Association (ITEA) (2000). Standards for Technological Literacy: Context for the Study of Technology. Virginia: ITEA

Jones, M.G. & Carter,G. (2007). Science Teacher Attitudes and Beliefs.In S.K. Abell & N.G Lederman (Eds.), Handbook of Research on Science Education

Kerre,B.W.,(2000). Science and Technology Teacher Education in Africa: Issues in the promotion of Scientific and Technological Literacy.Center for Teacher Education. Moi University, Africa. Retrieved from: http://portal.unesco.org/education/en/files/

Kennedy, P. (2004). A guide to econometrics. Cambridge, MA: MIT Press. Klassen, R. M. (in press). Teachers' stress: The mediating role of collective efficacy beliefs. Journal of Educational Research.

Klassen, R. M., Bong, M., Usher, E. L., Chong, W. H., Huan, V. S., Wong, I. Y., & Georgiou, T. (2009). Exploring the validity of the Teachers' Self-Efficacy Scale in five countries. Contemporary Educational Psychology, 34, 67–76.

Klassen, R. M., Usher, E.,Bong, M. (2010). Teachers' Collective Efficacy, Job Satisfaction, and Job Stress in Cross- Cultural Context. The Journal of Experimental Education, p. 464-486.18.

Klassen, R., and Chiu, M.M., (2010) Effects on teachers' self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. Journal of Educational Psychology, Vol 102(3), Aug 2010, 741-756.

Krajcik, J.S. & Sutherland, L.M. (2010).Supporting students in developing literacy in science. Retrieved from:www.ncbi.nlm.nih.gov/pubmed/ 20413490. Apr 23;328 (5977):456-9.

Kong, Y. (2005). A study of the relationship between job engagement of middle school teachers and its relative variables.1.5; no.11) 56-64. www.ccsenet. Org/journal. html.

Krumm,H.J.(2013). Teaching Proficiency. It's the Teacher that Matters. Department of German Studies University of Vienna. Retrieved from: www.goethe. de/en/spr/mag/20406817. html

Labadia, D. (2010). Organizational Commitment, Work Performance and Job Satisfaction Among the Faculty of the Religious of Virgin Mary (RVM) Schools in Southern Mindanao. Doctoral Dissertation, "Notre Dame University, Cotabato City".

Lapp, D. and Grant, M. (2011). Teaching Science Literacy. Educational Leadership (EL) Journal. March 2011. Vol. 68 (6).Retrieved from: http://www.ascd.org/ publications/educational-leadership/mar11/vol68/ num06/Teaching-Science-Literacy.aspx

Lewis, E., Musson, R., and Lu, J. (2013). Educating Highly- qualified Science Teachers : DBER Group Discussion on 2013-10-17. Retrieved from: http://goo.gl/Be98DA Study of the Student Characteristics Influencing the Four Theoritical Sources of Mathematical Self-Efficacy of College Freshmen. University of Kentucky. UK Knowledge Journal (1). Retrieved from: http:// uknowledge.uky.edu/stem

Loveless, T. (2013). The Latest TIMSS and PIRLS Scores. Retrieved from: http://goo.gl/AsNqNX

Lomax, R. and Li, J.(2013). Correlational Research Journal. Last Upadte: July 19, 2013. Retrieved from: http://goo.gl/Be98DA

Loo, C.W. & Choy, J.L.F., 2013, 'Sources of self¬efficacy influencing academic performance of engineering students', American Journal of Educational Research 1(3), 86–92. Retrieved from: http://dx.doi. org/10.12691/education¬1¬3¬4

Liu, X. S., & Ramsey, J. (2008). Teachers' job satisfaction: Analyses of the Teacher Follow-Up Survey in the United States for 2000 –2001. Teaching and Teacher Education, 24, 1173–1184.

Lunenburg, F. (2011). Self-efficacy in the workplace: implications for motivation and performance. International Journal of Management, Business, And Administration, 14(1),

Luckay, M. B., & Collier-Reed, B. I. (2014). An instrument to determine the technological literacy levels of upper secondary school students. International Journal of Technology & Design Education, 24(3), 261-273. doi: 10.1007/s10798-013-9259-3

Mackay, J. & Parkinson, J. (2010). Gender, selfIefficacy and achievement among South

African technology teacher trainees. Gender and Education, Volume 22, Issue 1: 87 – 103.

McKenzie, L. & Hannan, A. (2007). What are the advantages and disadvantages of interviews? Interviews in Education Research. Retrieved on 10th October, 2016 from www.edu.plymouth.ac.uk/resined/interviews/inthome.htm#A. Introduction

Moalosi, W. T. S. (2012). Teacher Efficacy: Is Student Engagement Essential in Botswana Junior Secondary Schools? International Journal of Scientific Research in Education, 5(3), 207 – 213.

Mohammed, K. H., Atagana, H. I. & Edawoke, Y. (2014). The difference between male and female students' self-efficacy, academic engagement and academic achievement in biology among grade ten students in South Wollo Zone schools in Ethiopia. Mediterranean Journal of Social Sciences, Vol 5 No 23: 804 – 813.

Magno, C.(2005) the Role of Metacognitive regulation and Learning Approach on Achievement and its effect on Academic Self-Efficacy.Paper presented at the annual Psychological Association of the Philippines, Baguio, Philippines.

Marshall, J., Horton, J., Igo, B., & Switzer, D. (2009). K-12 science and mathematics teachers beliefs about and of Science and Mathematics Education, 7, 575–596 Mwamwenda, T. S Mwamwenda, B. B. (2002).Teacher Characteristics and pupilsAcademic Achievement in Botswana Primary Education International Journal of Educational Development. 9, 1, 31-42.

Naderi, H. et al. (2009). Creativity, age and gender as predictors of academic achievement among undergraduate students. Journal of American Science: Vol 5 (5), 101 -112. Marsland Press.

National Science Board. (2010). Science and Engineering Indicators 2010. Arlington: National Science Foundation.

National Academies Press. (2012).A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. National Academies Press Journal. https://www.nap.edu/catalog/13165/

Nakabugo, M. G., Opolot-Okurut, C., Masembe, C. S. , Mugimu, C. B., Ezat, B. & Hurd, S. (2007). Large class teaching in Uganda: Implications for e-learning. Conference paper. Distance Education and Teacher Education in Africa.

Obama, Barack. (2009). American Association for the Advancement of Science News/: Retrieved from: http://goo.gl/SFwoMP.

Odongo, G. (2011). Teacher perceptions of their readiness to educate children with sensory disabilities in Kisumu local education authority-Kenya: Bringing change that leads to new beginnings. Albuquerque: American Council on Rural Special Education (ACRES) Conference.

OECD. (2008). 21st Century Learning: Research, Innovation and Policy. Direction from Recent OECD Analysis pp.6-19. Retrieved from: http://www.ncp. edu/read/13165/Chapter/15.

OECD (2009). Creating Effective Teaching and Learning Environments: First Results from TALIS – ISBN 978- 92-64-05605-3 46

OECD. (2013). PISA 2012 Assessment and Analytical Framework. Paris: Organization for Economic Cooperation and Development (OECD)

Ogena, E.B. (2005). Science education in the Philippines: Challenges for development. Taguig, Philippines: Science Education Institute.

Ongowo, R. & Hungi, S. (2014). Motivational beliefs and self-regulation in Biology learning: Influence of ethnicity, gender and grade level in Kenya. Creative Education, Volume 5: 218 – 227.

P 21. (2011). Partnership for 21st Century Skills (P21). Framework for 21st Century Learning. Retrieved from http://www.P21.org on July 10, 2014 Melbourne, October 19-21.

Palma, Jesus C. (2009). Curriculum Development System: A Handbook for School Practitioners in Basic Education, 2nd edition. Mandaluyong City: National Bookstore. pp. 17, 94.

Palmer, D. (2006). Sources of self-efficacy in a science methods course for primary teacher education students. Research in Science Education, 36, 3 3 7 353. Doi:10.1007/s11165-005-9007-0

Petersen, E., (2013). Retrieved from http://smallbusiness. chron.com/ self-efficacy-theory-workplace- 10330. html

Pelaez, W. (2013). Emotional Intelligence (EQ), Self- Assertiveness, and Self-efficacy of Public School Elementary Teachers in the Division of Canlaon City. PISA. (2013). Draft Science Framework 2015. OECD Retrieved from: https://www.oecd.org/pisapisaproducts/ pisa2015draftframeworks.htm

Philippine Statistics Authority- National Statistical Coordination Board Region VI. (2013). Fact Sheet: Western Visayas.

Posnanski, T. J. (2002). Professional development programs for elementary science teachers: Ananalysis of teacher self-efficacy beliefs and a professional development model. Journal of Science Teacher Education, 13, 189–220. Doi:10.1023/a:1016517100186

Popoola, S. O., & Oluwole, D. A. (2007). Career commitment among records management personnel in Osun State civil service in Nigeria.Records Management Journal 17 (2): 97-116. Retrieved from:http://unllib.unl.edu /LPP/adio-popoola.htm

Popoola, S.O (2006). Personal factors affecting organizational commitment of records management personnel in Nigerian State Universities. IFE Psychologia . 2006;14:183–97

Protheroe, N. (2008). Teacher efficacy: What is it and does it matter? Principal: 42 – 45.

Q Finance - The Ultimate Financial Resource (2009). Retrieved from http://www.financepractitioner.com/ dictionary/length-of-service

Raburu, P. A. (2011). Women academics' careers in Kenya. Unpublished PhD Thesis. Lancaster University, UK. Reid,L.&Weiser,B. (2009). Teacher knowledge, instructional expertise, and the development of reading proficiency. Sep-Oct;42(5):475-80. Retrieved from: www.ncbi.nlm.nih.gov/pubmed/19675317

Roberts, D. A. (2007). Scientific Literacy/Science Literacy. In S.K. Abell & N.G Lederman (Eds.), Handbook of Research on Science Education (pp.729-780)

Rodriguez, A.I. (2015). Impact of Chronological Age Differences on the Academic Performance of Students in a First-Grade Classroom. Southern Adventist University, arodriguez@southern.edu

Ross, J. A., Hogaboam-Gray, A., & Hannay, L. (2001). Effects of teacher efficacy on computer skills and computer cognitions of Canadian students in K–3. Paper presented at the annual meeting of the American Educational Research Association, Seattle

Rutherford, F.J. (1964). The role of inquiry in science teaching. Journal of Research in Science Teaching, 2, 80 – 84.In Lewis, T. Design and Inquiry: Bases for an Accommodation between Science and Technology Education in the Curriculum?. Journal of research in science teaching. Vol. 43, pp. 255-281 (2006)

Rychen, D. And Salganik, L. (2003) Definition and Selection of Key Competencies. Contributions to the Second DeSeCo Symposium Geneva, Switzerland,February, 2002

REPUBLIC ACT NO. 10533:Enhanced Philippine Basic Education System. 1987 Philippine Constitution,Republic of the Philippines.

Saygili, G., Isik, A.D., and Tehneldre, S. (2012) A Study on Music Proficiency Levels of Teachers Serving at Different Institution. International Journal of Music and Performing Arts. Published by American Research Institute for Policy Development. June 2015, Vol. 3, No. 1, pp. 69-83 URL: http://dx.doi.org/10.15640/ ijmpa.v3n1a7

Schleicher, A., and Davidson, M. 2012. United States- CountryNote-Results from PISA 2012: OECD, pp. 1-2. Retrieved from: https://goo.gl/rcTN0A Schreiner,C. and Sjoberg S. (2006), How Do Learners in

Different Cultures Relate Science and Technology. Asia-Pacific Forum on Science Learning and Teaching. Vol.6 (2) Dec. 2005.

Scharlach, T. D. (2008). These Kids Just Aren't Motivated To Read: The Influence Of Preservice Teachers' Beliefs On Their Expectations, Instruction, And Evaluation Of Struggling Readers. Literacy Research And Instruction, 47, 158-173.

Schwarzer, R., & Hallum, S. (2008). Perceived teacher self-efficacy as a predictor of job stress and burnout: Mediation analysis. Applied Psychology: An International Review, 57, 152–171.

Skaalvik, E. M., & Skaalvik, S. (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher

efficacy, and teacher burnout. Journal of Educational Psychology, 99, 611– 625.

Schweingruber,H. & Shouse,A. (2007). Taking Science to school: Learning and teaching Science in Grade K-8. The National Academies Press Journal. Retrieved from: hhttp://www.nap.edu/catalog/11625.html

SEI-DOST & UP NISMED. (2011). Framework for Philippine Science Teacher Education. Manila: SEI- DOST & UP NISMED. pp. 4-8, 14, 18-33.

Sen, K. (2008). Relationship between job satisfaction and Job Stress among teachers and managers. Indian Journal of Industrial Relations, p. 14.24.

Sloane, F. C. & Kelly, A. K. (2003). Issues in high States testing programme (Electronic Version). Theory into Practice, 42, 1, 12-17.

Statistics Canada (2016). Instructional Programs Canada. Retrieved Date: 12 November 2016. Retrieved from: http://www.statcan.gc.ca/eng /concepts/definitions/

Sulaiman, S., Bakar, M., Arshad, Y., Ismail, Z. and Abdullah, F. (2014). Promoting Scientific and technological Literacy Among Postgraduate Students At The Faculty of Education. UTM. I n d o n e s i a n Education Journal Review Vol.1 (2).Retrieved from: http://pps.unj.ac.id/ journal/ijer/article/view

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing and elusive construct. Teaching and Teacher Education, 17, 783-805.

Tshannan-Moran M., Hoy, A. W., & Hoy, W. K. (1998) Teacher efficacy: Its meaning and measure. Review of Educational Research, 68(2), 202– 248.

Tim Khlai, B. (2006). Job satisfaction contributing to job performance of the school director in China Province,Thailand. Doctoral Dissertation, Ateneo de Davao University,Davao City.28.

Tucker, P. and Stronge, J. (2012). Linking Teacher Evaluation and Student Learning.

UNESCO. (2014). Education for All 2015 National Review Report: Singapore. Retrieved from: http://goo. gl/zPE8tl

UNESCO. 2014. EFA Global Monitoring Report (Summary) 2013/ 4. Teaching and Learning: Achieving quality for all, pp. 35-40. Paris, UNESCO. Retrieved from: http://goo.gl/hsI7f6

UNESCO. (2010). Current Challenges in Basic Science Education. Retrieved from: http://goo.gl/9LGiyj

WHO, World Health Organization (2017). Retrieved Date: 02 February 2017. Retrieved from:http://apps.who.int/gender/whatisgender/ en/

Weibell, C. J. (2011). Principles of learning: 7 principles to guide personalized, student-centered learning in the technology-enhanced, blended learning environment. Retrieved July 4, 2011 from https:// principlesoflearning.wordpress.com

Wieman, C. (2007). Science education in the 21st Century Using the Tools of Science to Teach Science. University of British Columbia and University of Colorado, Boulder.

Wenglinsky, H. (2002). The link between teacher classroom practices and student academic performance. Education Policy Analysis Archives, 10 (12). Retrieved on January 20, 2017 from http://epaa. asu.edu/epaa/v10n12/.

Williams, J.D. & Takaku, S., 2011, 'Help seeking, self- efficacy, and writing performance among college students', Journal of writing research 3(1), 1–18.

Wiliams, Y. (2016) Life Span Developmental Psychology. College of Psychology and Ethics. Psychology Study Journal http://study.com/academy/lesson/ chronological-age-definition-lesson.html. Retrieved Date: 02 February 2016

Wilson, B. and Robinson, V. (2012). Predicting teaching performance: Proceed with caution. Journal of Assessment and Accountability in Education Preparation: Volume 2 (1), 58-61.

Wolters, C. A., & Daugherty, S. G. (2007). Goal structures and teachers' sense of efficacy: Their relation and association to teaching experience and academic level. Journal of Educational Psychology,99, 181–193.

Woolfolk Hoy, A., & Burke Spero, R. (2005). Changes in teacher efficacy during the early years of teaching: A comparison of four

measures. Teaching and Teacher Education, 21, 343–35

Zhang, A. (2005). Teacher's Performance and its Attitudinal Antecedent http://www.aare.edu.au/04pap/fan04091.pdf http://www.personainternet.com/bdavis/Paper.pdf 29.

Zizovsky, R. (2003). Teachers‟ qualifications and their impact on students' achievement. Findings from Times 2003 data for isral: http: www.ierinstitute.org/ IER1_Monograph volume -02 chapter 01.pd Fs-.