Journal for Educators, Teachers and Trainers
The PROFESIOLab electronic, peer-reviewed, open-access Magazine

ISSN 1989 – 9572

DOI: 10.47750/jett.2023.14.03.050

Assessment of Grade Implementation 7 of the K to 12 Science Standards

Reah Ann A. Torres

Journal for Educators,Teachers and Trainers, Vol. 14 (3)

https://jett.labosfor.com/

Date of reception:22 Feb 2023

Date of revision: 04 Mar 2023

Date of acceptance: 19 Apr 2023

Reah Ann A. Torres (2023). Assessment of Grade Implementation 7 of the K to 12 Science Standards.*Journal for Educators, Teachers and Trainers*,Vol. 14(3). 411-419.

---

[1]Iloilo Science and Technology University,Burgos St., La Paz, Iloilo City5000,Philippines

Journal for Educators, Teachers and Trainers
The LabOSfor electronic, peer-reviewed, open-access Magazine

Journal for Educators, Teachers and Trainers, Vol. 14 (3)
ISSN 1989 – 9572
https://jett.labosfor.com/

Assessment of Grade Implementation 7 of the K to 12 Science Standards

Reah Ann A. Torres
Iloilo Science and Technology University,Burgos St., La Paz, Iloilo City5000,Philippines
Email:reahann.torres@isatu.edu.ph

ABSTRACT

This evaluative survey research determined the implementation of K to 12 science standards in stratified randomly selected public secondary schools in the Province of Iloilo as viewed by the implementers. It looked into the intended Grade 7 science standards and how they were implemented in the actual classroom setting. It further determined the problems met by the respondents during the implementation process. Data sources included a questionnaire checklist, students' learning competency test results, and focus group discussions with respondents. Frequency count, means, percentages, and standard deviations are for quantitative data analysis, while ANOVA is for inferential data analysis. The reached conclusions utilised problem tree analysis to determine the problems and gaps teachers have encountered and their recommendations to improve implementation. The generally assessed Grade 7 K to 12 science standards resulted in "Somewhat Fully Implemented", and they only vary in terms of instructional materials used and science laboratory equipment and facilities standards, with category C schools as the least favoured schools. Students were "Approaching Proficiency" in their level of learning competencies. They noted a significant difference in students' mean scores when classified in the category of schools favouring category A schools. A significant and strong positive relationship existed between teachers' self-assessed implementation of science learning competency standards and students' test scores in science learning competency tests. Feedback from teacher respondents showed that standards on science laboratory equipment were the least given attention among the five K to 12 science standards. It revealed that teachers need more knowledge and skills in using science laboratory equipment to enhance their teaching skills and even conceptual knowledge on the selected topics covering the four learning areas of science. A Hands-On Seminar workshop resulted in participants' apparent increase in competency skills in conducting experiments.

Keywords: Assessment, Science standards, content standard, Implementation, competency

1. INTRODUCTION

The Philippines has witnessed a series of educational systems and curricular reforms from the pre-Spanish times to the present (Doronilla, 1999). All these reforms and implementations aim to improve the quality of Philippine education. However, despite these constitutional guarantees, current performance indicators showed a dismal picture of the country's education quality. Participation rates have worsened, drop-out rates remain high, and the Philippines continues to perform poorly in both national and international assessment tests (Department of Education, 2013).

The Department of Education has taken action and discovered that the challenge lies in congested curricula. The Department of Education claimed that forcing in 10 years a curriculum learned by the rest of the world in 12 years has been quite a challenge for Filipino teachers and students(Department of Education, 2013). As a result, the Philippine education system developed a goal to foster scientific literacy among students, preparing them to be informed and active citizens who can make judgments and decisions regarding the applications of scientific knowledge that may have social, health, or environmental impacts.

The K to 12 curriculum intertwined science content and processes; learners can best utilise science process skills through contextual learning instead of depending exclusively on textbooks. Various hands-on, minds-on, and hearts-on activities will develop kids' interests and make them active learners. The organized curriculum around circumstances and challenges that challenge and pique students' curiosity.

Overall, the K to 12 science curriculum is learner-centred and inquiry-based, emphasising evidence in constructing explanations. Concepts and skills in life sciences, physics, chemistry, and earth sciences are presented with increasing levels of complexity from one grade level to another (spiral progression), thus paving the way to a deeper understanding of a few concepts (Department of Education, 2013). These concepts and skills are integrated rather than discipline-based, stressing the connections between science topics and other disciplines and applications of concepts and thinking skills to real life.

2. LITERATURE REVIEW

The curriculum definition is a document that is written that includes several strategies in order to achieve the required goals. This plan has a starting point and an ending point for the overall progression. The most important school curriculum will go for nought when not used after development. There is a curriculum that is designed in an optimized way for students to get delivery; and should be implemented throughout all schools nationwide if it is to make an impact on the learning of students. Furthermore, Ornstein &Hunkins (2003) cited that everything should be developed and planned often needs to be implemented due to the reason of a plan lack for dispersal in their entire system of school.

There are school personnel that believe that the curriculum effort is complete once a new plan is developed, even with much discussion about change and restructuring of schools—more attention to organisation and management problems than curriculum change to implement the same novel process successfully. In fact, this will be encouraged for involving in the creative purpose.

Waxman (2001) have also mentioned that discrepancy that is happening in between a proposal of curriculum means to the designers and what it means to teachers that ask for the usage that is a common and problem that continues in the implementation of curriculum. For him, there are many innovative within the educational programs that result from researcher and curriculum developer's failure in focusing to the implementation concerns and needs.

One of the reasons to focus on implementing is the crucial to success during the implementation of a curriculum that is new. It becomes possible to know the changes that has happened by attempting to conceptualise and measure directly. It have been pointed out that without knowing the implementation of black box, educators have no idea on the interpretation of the outcomes: Is the failure due to the reason of which the implementation of poor ideas have been put forward. It is the primary success due to an innovation that have been implemented well and requires some extra factors. In short, changes that are particular cannot be linked in the outcomes of learning without a proper data implementation. The urge to determine its implementation status becomes necessary when K to 12 curricula is made into law and implemented. It has been stated by some researchers that to focus on the implementation after a change of curricular is essential since it is only possible in knowing the changes that has happened when there is an attempt to conceptualise and measure it directly. The curiosity led to an innovation in between the time, and there are several people that have carried out, and there are time it become evident. Several times, it have been assumed that the corresponds uses the actual data for the intention of using it without using it in the environments.

As a process of reasoning from evidence, Pellegrino, Chudowsky, and Glaser (2001; in Ornstein and Hunkins, 2004) relate to the present study. According to these researchers, a chain of reasoning about student learning characterises all assessments. Ornstein and Hunkins (2004) suggest that this chain of reasoning also considers the realm of knowledge about the curriculum, its nature, development, and delivery. This focus on the curriculum as well as learning is necessary because students do not learn in a vacuum. Pellegrino, Chudowsky, and Glaser (2001) noted that data relates to something and relevant consideration. Data by themselves are meaningless. Their value as inputs to decision-making and conjecture only becomes evident through some interpretational context. Knowing some score by itself or describing some behaviour could be interpreted and judged to have value. Interpretation and making value judgments are possible only when educators have an understanding of what they are attempting to do, and what standards they want to achieve for their students' attempted behaviours.

This study aimed at determining how the intended K to 12 science standards are implemented in the actual classroom setting, as shown in Figure 1. It further ascertained the problems met by teachers as they implemented the new curriculum.

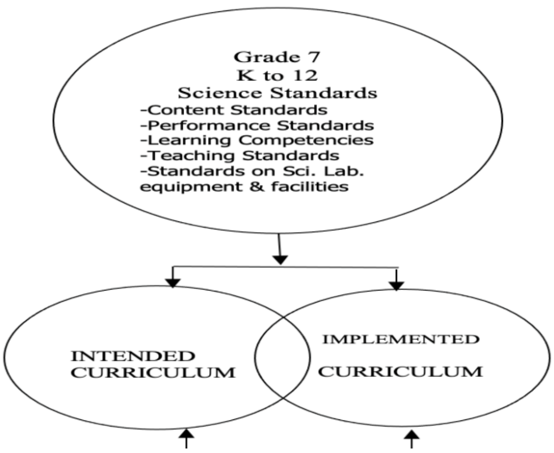

Figure 1:The components of Grade 7 K to 12 Science Standards.

3. METHODOLOGY

3.1. Participants

The participants involved in this study were from 26 out of 29 public secondary schools in the Second Congressional District of Iloilo Province, Philippines. There were a total of 39 science teacher respondents for the School Year 2014-2015. The sampling was done purposively to twenty student respondents from the same 26 schools and given a learning competency test to substantiate the questionnaire checklist of respondent teachers on learning competency standards.

Of the 39 Grade 7 secondary school teachers, 25 (64.1%) were from category A schools, and 7 (17.9%) were from each category B and category C schools. There were 11 (28.2%) male and 28 (71.8%) female respondents. Regarding the respondents' age, there were 22 (56.4%) young science teachers aged 40 and below and 17 (43.6%) older science teachers aged 41 and above. There were 18 (46.2%) teachers teaching 12 years and below, while 21(53.8%) teachers were teaching for 13 years and above. Only one respondent was a head teacher (2.6%), and the rest of the 38 (97.4%) respondents were classroom science teachers. As to the teacher respondents' major field of study, 13 (33.3%) were general science, 10 (25.6%) were physics, 5 (12.8%) were chemistry, 9(23.1%) were biology majors, and 2 (5.1%) were non-science majors but teaching Grade 7 science. Regarding educational attainment, only 3 (7.7%) held a Master's degree in science education, and 19(48.7%) had Master's degree units in science education. Seven teachers (17.9%) had Master's degree units but not in science education, and 10 (25.6%) were bachelor's degree holders.

3.2. Data Gathering Procedure

With proper permission from their head, each randomly picked teacher-respondents was visited and explained the purpose of the investigation. They received a copy of the research instrument and were left to them for a week to complete the evaluative survey forms. After that, the researcher personally retrieved the questionnaires. In the case of student- respondents, the test questionnaires and the answer sheets were gathered right after they finished the test within an hour-coded and numbered for statistical treatment and analysis. Afterwards, it scheduled focus group discussions with the teacher-respondents from each category. The purpose is to gather the information that would help explain and interconnect with the statistical findings.

3.3. Data Gathering Instrument

3.3.1. Evaluative Survey Questionnaires.

The six evaluative survey questionnaires used a 5-point Likert Scale from which the teachers indicated their appraisal by checking the column of forms 1, 2, 3, and 4 along the fully implemented to not implemented and forms 5 and 6 along very adequate to not available continuum for each item. Based on the table below, the respondents rated each statement in forms 1, 2,3, and 4.

Table 1:The 5-point Likert Scale used on Teacher's Self-Assessed Implementationof the Science Standards

Description	Interpretation
Fully Implemented	means that the intended standard is 81% to 100% implemented
Somewhat fully implemented	means that it is 61% to 80% implemented
Somewhat implemented	means that it is 41% to 60% implemented
Somewhat not implemented	means that it is only 21% to 40 % implemented
Not Implemented	means that it is 0% or not at all implemented to only 20% implemented

Table 2:The 5-point Likert Scale used on the Adequacy and Availabilityof Teaching Materials and Science Laboratory Apparatuses

Description	Interpretation
Very Adequate	means that the instructional material, tool, and equipment used in the teaching science standard is very substantially available or provided and that it is 76% to 100% adequate
Adequate	means that the instructional material, tool, and equipment used in the teaching of science standard is substantially available or provided and that it is 51% to 75% adequate
Moderately Adequate	means that the instructional material, tool, and equipment used in the teaching of science standard is reasonably available or provided and that it is 26% to 50% adequate
Barely Adequate	means that the instructional material, tool, and equipment used in the teaching of science standard is slightly or minimally available or provided

	and that it is 1% to 25% adequate
Not Available	means that the instructional material, tool, and equipment is neither available nor provided in the teaching of science standard

To interpret the obtained mean scores on the responses of teacher respondents on how they assess their implementation of the science standards, the researcher used the following interpretation guide: For forms 1 to 4, 4.51 – 5.00 (Fully Implemented), 3.51 – 4.50 (Somewhat Fully Implemented), 2.51 – 3.50 (Somewhat Implemented), 1.51 – 2.50 (Somewhat Not Implemented), and 1.00 – 1.50 (Not Implemented). For forms 5 and 6, 4.51 – 5.00 (Very Adequate), 3.51 – 4.50 (Adequate), 2.51 – 3.50 (Moderately Adequate), 1.51 – 2.50 (Barely Adequate), and 1.00 – 1.50 (Not Available). A face-to-face content validation to all six forms, with Cronbach alpha reliability coefficient ranging from .93 to .98.

3.3.2. Researcher-made Learning Competency Test.
A 95-item multiple-choice test was designed for Grade 7 student respondents to substantiatethe teachers' feedback on the Learning Competency standards checklist. The test items were patterned after the intended science learning competency standards prescribed by the Department of Education utilised test items. Each test covered four science areas: biology, chemistry, physics, and earth science. The test was conducted in two separate sessions with 1 hour per session. The first test schedule included items in biology and chemistry, while the second included physics and earth science.
To interpret the obtained mean scores for each class and the level of learning competencies of the Grade 7 student respondents, the researcher used the following interpretation guide based on the classroom assessment for K to 12 Basic Education Program under the DepEd Order No. 08, s. 2015. In this study, the range of scores was determined based on the following percentages: 0% - 20%, beginning; 21%- 40%, Developing; 41% -60%, Approaching
Proficiency; 61%-80%, Proficient, and 81%-100%, Advanced. This instrument underwent face and content validity, was pilot-tested, and item analysed using the U-L Index Method. All poor and marginal items were rejected, while all outstanding items were accepted. Reasonably good items were selected, revised, and considered in the final 95-item Grade 7 science learning competency test. To measure the reliability of the test, the researcher employed the test-retest method, and the reliability coefficient obtained was .89.

3.3.3. Questionnaire for Focus Group Discussion.
This method was conducted to follow up, refine, and complement the quantitative findings. This qualitative method of obtaining data collection allowed the respondents to explain and voice their opinions and perceptions on implementing the new K to 12 science standards. It determined varied problems, strengths, weaknesses, and gaps encountered and teacher respondents' probable recommendations for implementing K to 12 science standards using the problem tree analysis. Interviews were videotaped for easy transcription and lasted for a minimum of fifty minutes to a maximum of two hours in the place and time set by the participants.

4. DATA ANALYSES
The data generated for the study were both quantitative and qualitative. Concerning the statistics that is descriptive, count of frequency, percentages, and deviations of standard that have been used. The statistics that are inferential have been used were and set at the alpha 0.05 level of significance. ANOVA was used to determine whether significant differences would exist in the means of secondary schools categorised into three groups in terms of the implemented Grade 7 K to 12 science standards and their levels of implementation.

5. RESULTS AND DISCUSSION
5.1. The Grade 7 Science Standards and Their Level of Implementation
5.1.1. As a Whole
Teachers assessed their implementation of Grade 7 K to 12 science standards primarily as "Somewhat Fully Implemented". They viewed and claimed that they "Somewhat Fully Implemented" the content standards (M=4.27, SD=.61), the performance standards (M=3.91, SD=.77), learning competency standards (M=4.18, SD=.68), as well as the teaching standards according to instructional approaches and methods used (M=3.84, SD=.65). Instructional materials, aids, and tools used were rated as “Adequate” (M=3.53, SD=.76) while on science laboratory equipment and facilities, standards were rated as "Moderately Adequate" (M= 2.97, SD=1.0).
Only one content standard was "Fully Implemented", and it was one of the first quarter lessons, while those content standards with the lowest means were topics included in the last quarter. As mentioned during the focus group discussion, teacher-respondents revealed that they could hardly cope with the topics due to disruption of classes, like unexpected storm signals and some school activities.

In performance standards, practical topics like Disaster Preparedness are stressed in the classroom since they are necessary as essential survival act with the type of weather in the Philippines. This topic appeals to students since they can relate it to their experiences during typhoon surges. In aiming for full engagement, students must perceive activities as being meaningful. Research has shown that students must consider a learning activity worthy of their time and effort to engagesatisfactorily or even disengage entirely in response (Fredricks, Blumenfeld, & Paris, 2004). Teachers can connect lessons with students' previous knowledge by highlighting the value of their experiences in personally relevant ways to ensure that lessons are personally meaningful.

Those learning competencies that were fully implemented were topics in the first quarter which are related to life science. The least implemented learning competencies were physics topics. It also showed that most learning competencies in the last quarter were least implemented. Teachers were in a dilemma of not holding classes and finishing the intended learning competencies because they prioritised working with several forms required by the DepEd. This issue would affect the spiral progression approach in teaching science subjects since the lessons in the next grade level are continuations of the lessons of the previous grade level.

Regarding the teaching methodology, teacher exposition, specifically the lecture discussion and demonstration activity, is still the commonly implemented strategy in teaching Grade 7 science. The inquiry-based approach is the recommended approach with the highest mean. Here, the teacher focused on pre-and post-activity discussions and activity result analysis. However, they gave minor importance to letting students identify questions that can be answered through scientific investigations or allowing students to design and conduct scientific/unstructured investigations. Teachers cannot let their students explore independently due to not being adept at learning independently, even the higher-section students and, worse, those in the lower sections. If they let their students investigate independently, a longer time is needed before they can finish, and they usually get delayed in their time frame. The teacher-respondents supported this matter during the focus group discussion, stating that students are still incompetent with discovery learning. One teacher from category A school mentioned that some of her students could not understand even when answers were already given. The students needed help to follow even the given step-by-step procedures. Category B teacher commented that the inquiry-based approach applies only to the first section learners but was found ineffective to learners in the second and lower sections. Teachers agreed that performance activities found in the module are ideal only for fast learners but only for some of their students who are slow learners. In addition, the spiral progression approach in teaching science subjects seemed tedious to teachers. Their time is spent chiefly on studying new learning areas that are not their major field of specialisation, yet they must teach. Regarding teaching materials and tools, it shows that teachers still commonly use the traditional chalkboard, figures/pictures and drawings, books, and hand-outs in delivering science lessons. The teachers believe in the potential of technology in the learning process, but unfortunately, the Department of Education needs help to afford to provide these to secondary schools.

Science laboratory rooms with unique facilities where experiments are done are "Barely Available" in secondary schools. Some standard laboratory equipment and consumables are "Barely available" if not "Moderately available". Using science laboratory activities in the classroom can enhance science instruction by involving students in real-world research projects and fostering a more learner-centred and inspiring environment.

5.1.2. As to the Category of School.

Generally, Grade 7 content standards, performance standards, learning competency standards, and teaching strategy and methods standards were "Somewhat Fully implemented" when classified as category A, category B, and category C schools. All three categories also assessed the laboratory equipment and facilities standard as “Moderately Adequate”. The teacher-respondents have the same assessment on implementing these standards when classified as to the school category. This result could be because these standards are attributed to teachers' content knowledge of the topic and their competency as science teachersirrespective of the category of school to which they belong. Most of the respondents in this study are experienced teachers, having been in the teaching field for more than 5 years. Content knowledge refers to the body of information that teachers teach, and students are expected to understand. The Grade 7 teacher-respondents have sound science content knowledge regardless of the school category to which they belong. Teaching K to 12 science requires teachers to be adept in the four learning areas of science in the spiral progression curriculum. However, these teachers mentioned that the content topics in Grade 7 are basic concepts, so even if they are not specialised in that area, they can teach them by studying them. Others also mentioned that they could teach them but needed to be more competent in teaching the topics in their major field of specialisation.

5.2. Students’ mean scores and level of learning competencies

5.2.1. As a Whole and when categorised into schools.

As shown in table 4, Grade 7 student respondents (M = 51.90, SD = 9.83) were “Approaching Proficiency” in their level of learning competencies even when classified as to category A ($M_{cat.A}$=56.43, SD=6.56), category B ($M_{cat.B}$=42.37, SD=5.81), and category C ($M_{cat.C}$=45.28, SD=12.77). This result means that students have

developed the fundamental knowledge, skills, and core understanding with little guidance from the teacher or with some peer assistance and can transfer them independently through authentic performance tasks.
The improvement in students' level of learning competencies is mainly attributed to teachers. Teachers have a noticeable influence on the student's learning process. As mentioned by Penick (1995), teachers continue doing what they have always done even with curricular changes that intend them in developing contexts of learning that are rich and students have been challenged in becoming skilful thinkers and great solvers of problems, be creative, applying the process of learning for their student's needs, and changing flexibly.

Table 3:Student Respondents' Mean Scores and Level of Learning Competencies

Grade Level	School category	Mean	Descriptive Rating	SD
Grade 7	Category A	56.43	Approaching Proficiency	6.56
	Category B	42.37	Approaching Proficiency	5.81
	Category C	45.28	Approaching Proficiency	12.77
	Overall	51.90	Approaching Proficiency	9.83

Note: Scale: (For Grade 7) 77-95, Advanced; 58-76, Proficient; 39-57, Approaching Proficiency; 20-38, Developing; and 0-19, Beginning.

5.3. Comparison of the Students' Mean Scores among the Three Categories of Secondary Schools
The results of ANOVA on the students' mean scores in the science learning competency test reveal a significant difference t(36)=11.834, p = .000 on mean scores when students are categorised based on their school.Multiple Comparison was utilised to determine which groups are significantly different after obtaining a statistically significant result from an Analysis of Variance. As shown in Table 6, there are significant differences in the students' mean scores between category A and category B (p= 0.001) and between category A and category C (p= 0.008) but no significant difference between category B and category C (p= 0.787). It shows that students from category A schools performed better in the proficiency test compared to categories B and C. The reason is that teachers in category A schools managed to do the team teaching, which categories B and C could not do.

Table 4.Differences in the Students' Mean Scores among the Three Categories of Secondary Schools.

Grade Level	Mean Scores				Sum of Squares	df	Mean Square	F	Sig.
	C_A	C_B	C_C						
Grade 7	56.43	42.37	45.28	Between Groups	1455.568	2	727.784	11.834*	.000.
				Within Groups	2213.996	36	61.5		

*p<.001

Table 5:The difference in the Students' Mean Scores among the Three Categories of Secondary Schools

Grade Level	(I) category	(J) category	Mean Difference (I-J)	Sig.
Grade 7	Category A	Category B	14.06189*	0.001
		Category C	11.14760*	0.008
	Category B	Category C	-2.91429	0.787

p<0.05

6. CONCLUSIONS

The intended K to 12 science curriculum is appropriate for secondary school learners. When categorised into schools, the significant difference in students' learning competencies attributed to the availability and adequacy of science laboratory equipment and facilities, the teacher's major field of specialisation, the availability and adequacy of instructional materials and tools, and the needs and needs and level of competency of students.

The homogeneity of teachers' self-assessed implementation of science standards regardless of school category they taught the topics they intended to teach. Nevertheless, the student's scores could be otherwise due to how meaningful the teacher delivers the lesson. A teacher can discuss in-depth and practical learning when it is her/his primary field of specialisation. In category A schools and some category B schools with significant populations, teachers do team teaching, which category C schools could not do.

Several school activities and declared legal holidays caused class disruption, resulting in the minor implementation of last quarter's topics. Even with the advent of information and communication technology, science teachers still use traditional chalkboards, figures/pictures and drawings, books, and hand-outs to deliver science lessons. Technology-assisted learning experiences seem limited, although teachers believe in the potential brought about by technology in the learning process.

Science laboratory resources play a vital role in the inquiry-based learning approach in teaching science, giving particular attention. The secondary schools in the present study are public-owned institutions supported by the state; thus, the common observation is that when the government is the source of equipment, facilities, and other related needs, such will always be limited.

Small schools are the least favoured schools regarding the school budget on facilities and science laboratory equipment. Thus, teachers' ingenuity and resourcefulness in teaching science are necessary. Teachers must be creative to use whatever resources are available or substitute unavailable materials with locally available and improvised ones and be innovative enough to revise laboratory activities to suit the needs of their students. Better learning outcome results in better facilities, teaching materials, tools, and science laboratory equipment.

There is a significant involvement of different textbooks in this study, as evidenced by teachers teaching topics outside their expertise rather than attempting in explaining the content of science that have not been understood fully, thereby leaving the students in memorising different facts from textbooks.

There is a need for more hands-on seminar workshops, especially for science teachers, to improve their skills and competency in conducting science laboratory activities since learning science calls for more science laboratory investigations. Upgrading teachers teaching other learning areas outside their major field is a must. The spiral progression approach in teaching science was found problematic by the teachers. They agreed that their expertise is outside the needs of the new K to 12 science curricula. Most science teachers were graduates in one major field. Only a few science teachers are general science significant graduates.

REFERENCES

1. Alwardt, R. K. (2011). Investigating the transition process when moving fromA spiral curriculum alignment into a field-focus science curriculum alignmentin middle school. A Dissertation submitted to the Education Faculty of Lindenwood University. Retrieved from http://gradworks.umi.com/ 3450281.pdf
2. Davis, K.S. (2002). "Change is hard": What science teachers are telling us about reform and teacher learning of innovative practices. Science Education, 87,3-30.
3. De Dios, Angel C. (2012). Sequence of Science Courses. Retrieved from http:/www.philbasic education.blogspot.com/search/label/spiral%20 approach
4. Department of Education. (2013). K to 12 Curriculum Guide Science (Kindergarten to Grade 12.)Retrieved) from http:/www.Odea.sdb.ph/ODEA/downloads/Kto12 Science-CG-as-of-Apr-25-2013.pdf
5. Department of Education Order No.45,s. 2013. Guidelines on the Provision of Science and Mathematics Equipment for Fiscal Year 2013. Retrieved from www.depedmalaybalay.net/up-content/uploads/2013/01/unnum-memo-127.pdf
6. Department of Education Order No.8 s. 2015. Policy Guidelines on Classroom Assessment for the K to 12Basic Education Program. Retrieved (01/30/16) from http://www.deped.gov.ph/sites/default/files/order/2015/DO_s2015_08.pdf
7. Doronila, M. L. (1999). The Transformation of Philippine education: An analysis and Critique of Some Current and Emerging Policy Reforms.
8. Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. Review of Educational Research, 74(1), 59-109.
9. Fullan, M. and Pomfret, A. (1977). Research on curriculum and instruction implementation. Review of Educational Research, 47(1), 335-397.

10. Hall, R. (1997). Knowledge use and the dynamics of managing curriculum change. Science Communication, 18(4), 342-362.
11. Hall, S. (2012). The Descriptive Method of Research Design. Retrieved from www.ehow.com/how_7905125_descriptive-method-research-design.html.
12. Lauer, Patricia et al. (2005, Aug.19). The Influence of Standards on K-12 Teaching and Student Learning: A Research Synthesis. U.S. Department of Education McREL 2005. Retrieved from www. Mcrel.org/~/media/Files/McREL/Homepage/Products/01_99/prod33_influestandsynth.ashx
13. Penick, J.E. (1995). New goals for biology education. Bioscience, 45(6), 52-58
14. Ornstein, A.C. &Hunkins, F.P. (1998). Curriculum: Foundations, principles, and issues. (3rd Ed.). Allyn and Bacon
15. San Pedro, D. (2013, May 15). INTERAKSYON: Aquino signs K-12 enhanced basic Education law (www page). URL http://www. Interaksyon.com/article/61826/Aquino-signs-k-12-enhanced basic-education-law
16. Waxman, H. C. (2001). Research on school-based improvement programs: Its implications for curriculum implementation. Education, 15(3), 318–322.
17. Weiss, I.R., Pasley, J.P., Smith, P.S., Banilower, E.R., & Heck, D. (2003, May).Looking inside the classroom: A Study of K-12 mathematics and science education in the United States. Retrieved from http:// www.Horizon-research.com/insidetheclassroom/reports/looking/complete.pdf
18. Yager, R.E. (2000). A vision for what science education should be like for the first 25 years of a new millennium. School Science and Mathematics, 100(6), 327-342.