

# Development and Validation of a Module in Earth and Life Science for Grade 11 Students

Rodrigo T. Domingo

Dep Ed SDO Pangasinan 21, Pangasinan State University, School of Advanced Studies

DOI: <https://doi.org/10.47772/IJRISS.2023.7402>

Received: 23 February 2023; Revised: 15 March 2023; Accepted: 21 March 2023;

Published: 25 April 2023

## ABSTRACT

This study entitled “DEVELOPMENT AND VALIDATION OF A MODULE IN EARTH AND LIFE SCIENCE FOR GRADE 11 STUDENTS” is focused on the problems encountered in the management of instructional materials in Earth and Life Science for Grade 11 and on the development of a module based on the least mastered competencies in Earth and Life Science 11.

This study adopted the research and development method: data obtained were analyzed and became the bases for module development.

The production of the modules was based on the three (3) stages ADDIE’s model: Stage 1- Preparation; Stage 2- Development; and Stage 3-Validation. Five expert educators in Science were asked to validate the module.

Based on the data gathered. There are no available instructional materials in Earth and Life Science for Grade 11. Procurement of instructional materials are done as the need arises. Hence, teachers’ in-charge of the subject were the one who prepared and fund for instructional materials development of which were not accredited. On the other hand, the module developed was rated to be very satisfactorily accepted in terms of objectives, lessons, learning activities, instructional design, graphics and evaluation.

Since it was revealed that there is a problem with the extent of availability of instructional materials for Earth and Life Science 11, this module is hereby recommended for use. Further studies can be made to determine the effectiveness of the module to improve the academic performances of students.

**Keywords** –Module Development, Evaluation, and Acceptability

## INTRODUCTION

Education is essential for all of us. It is important because it helps to answer life’s big questions, including questions of how to live, work and love. Still others believe that education is important because it teaches people about the world around them. Education assists scientists in inventing equipment and devices, resulting in a high technology nowadays. The more developed life becomes, the more necessary education is for everyone.

Education is still our best armour in fighting poverty in the country. Hence, the government is trying its best in order to elevate its current state.

Former President Benigno S. Aquino III states:

“Naninindigan pa rin po tayo sa ipinangako nating pagbabago sa edukasyon: ang gawin itong sentral na

estrategiya sa pamumuhunan sa pinakamahalaga nating yaman: ang mamamayang Pilipino. Sa K to 12, tiwala tayong mabibigyang-lakas si Juan dela Cruz upang mapaunlad —hindi lamang ang kanyang sarili atpamilya—kundi maging ang buong bansa.”

The K to 12 Program is mandated by Republic Act 10533, otherwise known as “Basic Education Act of 2013.” The DepEd began the new learning program in its efforts to make a change towards a better Philippines as early as 2011.

Education Secretary [3] affirmed that the K to 12 education program is primarily geared to benefit Filipino learners and the country.[3] insisted that K to 12 is not only for our regional friends or for our international neighbor or for the global community, we are doing this for ourselves.

Senior High School (SHS) is two years of specialized upper secondary education of which students may choose a specialization based on aptitude, interests, and school capacity. The choice of career track will define the content of the subjects a student will take in Grades 11 and 12. SHS subjects fall under either the Core Curriculum or specific Tracks and Applied subjects. These two additional years will help the students to be more competitive and help them land a job after they graduate [3].

Earth and Life Science is considered as one of the core subjects in the curriculum. This learning area is designed to provide a general background for the understanding of Earth Science and Biology.

According to [1] student performance in international assessment studies on Science (TIMSS 1995, 1999, 2003) is consistently low. Students at Grade 4 and Second Year performed poorly in three cognitive domains: factual knowledge, conceptual understanding, and reasoning and analysis. The same results are observed in the National Achievement Test given by the Department of Education. Local studies have identified several reasons to account for this situation: lack of qualified teachers, an overloaded curriculum, lack of quality textbooks and instructional materials, and unavailability of science equipment.

Science teaching is more productive when there are available and sufficient instructional materials. Funds are not enough to cater to the needs on instructional materials needed in every science classroom. The science teacher therefore, is responsible to devise and provide the necessary materials for use in science classes[2].

With the limited funds available for purchasing classroom materials today, more and more teachers and educational administrators are relying on research to help guide them to the best programs to invest in. According to the database of Pangasinan Division II, there are no teacher made materials such as modules, instructional materials and intervention materials for the subject Earth and Life Science. It is for these reasons that the researcher embarks on developing a module. Science at present is a subject that should not be confined to mere reading of textbooks or listening to lecture. Science to be learned effectively must be experienced. Learning experiences are best realized through the use of variety of instructional resources.

We all know that SHS Program is now unstoppable on its implementation. Let us expect challenges along the way and exercise flexibility, creativity, and critical thinking in addressing its challenges. One of its challenges is the scarcity of instructional materials as identified as one of the reasons why students’ performances in Science was low. Thus, the researcher developed a module on Earth and Life Science based on the least mastered learning competencies in the division which serves as a supplementary material to better educate the students.

## **Objectives Of The Study**

This study aimed to develop and validate a learning module in Earth and Life Science for Grade 11 students

of Pangasinan Division II.

Specifically, the researcher sought to answer the following questions:

1. What is the status of management of instructional materials in Earth and Life Science in terms of:
  - extent of availability;
  - Frequency of procurement;
  - source of instructional materials;
  - source of fund, and
  - persons in-charge in accreditation?
2. What are the least mastered component/topic to be included in the proposed learning module in Earth and Life Science 11 based on the least mastered competencies?
3. What is the content validity of the proposed learning module in Earth and Life Science 11 along the following components:
  - objectives;
  - lessons;
  - learning activities;
  - instructional design;
  - graphics, and
  - evaluations?
4. What is the level of acceptability of the proposed learning module in Earth and Life Science 11 along:
  - objectives;
  - lessons;
  - learning activities;
  - instructional design;
  - graphics, and
  - evaluations?

## **MATERISLS AND METHODS**

This study employed the research and development method. Considering the nature of the research problem, this method is the most appropriate to use when a product such as an instructional material in the form of a module is to be developed and validated to determine its effectiveness as an educational tool.

### **Development of the Modules**

The production of the modules was based on the three (3) stages ADDIE's model: (Stage 1-Preparation; Stage 2- Development; Stage 3 Validation)

#### **1) Planning Stage**

The planning stage will deal on the review of the competencies and standards in the K-12 Curriculum guides for Earth and Life Science 11, survey of references and the designing of the modules.

#### **2) Development Stage**

The development stage involves on deciding the format, process and revisions in writing the module.

#### **3) Validation Stage**

And for the validation stage, writers and experts were asked in the field to assess the module in terms of its

objectiveness, lessons, learning activities, instructional design, graphics and evaluation; final revision of the proposed module; science teachers also assessed the level of acceptability of the proposed module; and the production of the final form of the module.

### Respondents of the study

There were three (3) groups of respondents. The first respondents were the 46 Earth and Life Science Teachers to identify the status of the management of instructional materials in Earth and Life Science and to determine the least mastered competencies of the subject. The second respondents were the 5 content experts to establish the content validity of the modules in terms of objectives, lessons, learning activities, instructional design, graphics and evaluation. This expert group is composed of principals, a head teacher and master teacher in Science.

The third group of validators was composed of principals, a head teacher and master teacher in science and 5 teachers teaching Earth and Life Science in the Division of Pangasinan II. These group determined the level of acceptability of the modules. They assessed the material along the following criteria: objectives, lessons, learning activities, instructional design, graphics and evaluation.

### Research Instrument

This study used the questionnaire as the main data-gathering instrument. The study used three (3) sets of questionnaire/checklist. The first part is the questionnaire to identify the status of the management of instructional materials in Earth and Life Science and to determine the least mastered topics in the subject.

The questionnaires used by [4] and [5] was adopted in the validation and level of acceptability which measures the validity of the parts /aspects of the proposed module. These was accomplished by principals, head teacher, master teacher, and teachers. Weighted mean was used as a statistical tool.

## RESULTS AND DISCUSSION

### Extent of Availability of Instructional Materials in Earth and Life Science 11

Table 1. Extent of Availability of Instructional Materials in Earth and Life Science 11

Instructional Materials	5	4	3	2	1	WM
1. Textbook	1	1	3	14	27	1.58
2. Work text	0	0	7	8	31	1.48
3. Workbook	0	1	4	12	29	1.50
4. Module	0	0	7	13	26	1.59
5. Manual	0	0	6	11	29	1.50
6. Worksheet	0	0	8	15	23	1.67
<b>Overall Mean:</b>	<b>1.55</b>		<b>Not Available</b>			

Legend: 4.21-5.00- Very Highly Available (VHA)      3.41-4.20- Highly Available (HA)

2.61-3.40- Moderately Available (MA)      1.81-2.60- Slightly Available (SA)

1.00-1.80- Not Available (NA)

It could be seen from the table based on the teachers' response that all instructional materials like textbook

(1.58), work text (1.48), workbook (1.50), module (1.59), manual (1.50) and worksheet (1.67) in Earth and Life Science 11 are “not available” in the Division of Pangasinan II.

Ferrer as cited by [4] addressed the country’s problem on the student poor achievement and scarcity of textbooks and supplementary materials in Chemistry in his study on the development and validation of a modular- based work book in high school Chemistry. He also developed two sets of checklist to test the validity and acceptability of his material.

Moreover, Fernandez as cited by [4] looked into the availability and suitability of available materials in tertiary English I. Being able to find out that there was a scarcity, she developed a work-text in English I that was subjected to content validity and acceptability test. The dimensions of the tests were limited to objectives, lessons, exercises, organization and presentation.

Estacio as cited by [6] said that availability of instructional materials in teaching refers to those resources necessary to carry out instructions in our educational institution. Therefore, instructional material must help learners to understand the better lesson, especially when a classroom has a great number of students, learning exercises should be made easy in order to answer Individual differences.

This implies that instructional materials must be made in order to cater the needs of Senior High School students in the subject Earth and Life Science 11. Among these interventions of the teachers are the development of Strategic Intervention Materials (SIM), Modules and Work-text.

**Table 2. Frequency of Procurement of Instructional Materials in Earth and Life Science 11**

Instructional Materials	Frequency									
	ANA	%	EY	%	E2Y	%	E3Y	%	N	%
Textbooks	31	67.4	1	2.2	5	10.9	0	0	9	19.6
Worktext	28	60.9	1	2.2	4	8.7	0	0	13	28.3
Workbook	26	56.5	1	2.2	5	10.9	0	0	14	30.4
Module	27	58.7	1	2.2	4	8.7	0	0	14	30.4
Manual	26	56.5	2	4.3	4	8.7	0	0	14	30.4
Worksheet	25	54.3	6	13.0	0	0	0	0	15	32.6

Legend: ANA-As the need arises

EY- Every year

E2Y- Every two years

E3Y- Every three years

N- Never

Table 2 shows how frequent schools in Pangasinan Division II procure instructional materials in Earth and Life Science for Grade 11. Procurement of instructional materials is done in the public schools through the Bureau of Learning Resources (BLR) and Learners’ Resources Management Development System (LRMDS). Learner’s manuals are given to schools depending on the availability. (<https://lrmds.deped.gov.ph>)

Data revealed that in all types of instructional materials listed, procurement of these materials is majorly done as the need arises. There are some schools who actually never procured any of these materials. These coincide with the information obtained about the availability of these materials. As procurement is not done on a regular basis and in some cases procurement is never done, the availability of instructional materials is affected. As a consequence, students of Grade 11 students must rely to the materials that their classroom teacher can provide them as of the moment.

Since the onset of the K-12 curriculum, learners’ materials and teachers’ guide are given readily to the Junior High School. But it is not the case for the Senior High School.

Due to specializations offered, students as much as possible should be given adequate facilities, chairs, books and equipment [7].

Consequently, [8] in his study find out that the top problems perceived by teachers that hinder their effective teaching includes inadequacy of laboratory facilities and equipment, insufficient library references, and classrooms which are not conducive for teaching-learning process.

This implies that scarcities of these will constraint educational system from responding more fully to new demands. In order to raise the quality of education, its efficiency and productivity, better learning materials are needed. Purchasing of additional books and giving trainings to the teachers on the recent development of the subject that they are teaching must be prioritized.

**Table 3. Source of Instructional Materials in Earth and Life Science 11**

Instructional Materials	Frequency									
	DOP	%	P/AP	%	HT	%	T	%	N	%
<b>Textbooks</b>	9	19.6	2	4.3	2	4.3	29	63.0	4	8.7
<b>Worktext</b>	4	8.7	1	2.2	2	4.3	36	78.3	3	6.5
<b>Workbook</b>	4	8.7	1	2.2	2	4.3	37	80.4	2	4.3
<b>Module</b>	3	6.5	1	2.2	1	2.2	38	82.6	3	6.5
<b>Manual</b>	3	6.5	2	4.3	3	6.5	36	78.3	2	4.3
<b>Worksheet</b>	3	6.5	1	2.2	1	2.2	40	87.0	1	2.2

**Legend:** DOP-Division Office Person P/AP- Principal/Assistant Principal

HT- Head Teacher 2T Teacher

N- None

Table 3 shows who produce the instructional materials for students who take Earth and Life Science for Grade 11. Since there is a problem with the availability of these materials and in addition, procurement of these materials is seldomly done, the classroom teacher or the one who teaches this subject takes charge of producing the needed instructional materials for the class.

There are cases that the head teacher or the principal is the one who prepares the instructional materials. Likewise, personnel from the division office help in the production of instructional materials.

[9] pointed out that there is an untimely delivery of supply, paid access and frail internet connection and vast higher leveled information were the problems encountered upon using the instructional materials in the Senior High School.

Further, [9] recommended that the administrators and teachers must devote time on the development of Senior High School instructional materials on Learning Action Cell (LAC) sessions, semester break, INSET’s among others to produce a wide pool tailored fit teaching tools and materials.

This implies that administrators and teachers must help hand and hand in innovating instructional materials to elevate the quality of instructional materials in the teaching learning process and ensure that the needs of the learners will be met.

**Table 4: Source of Fund of Instructional Materials in Earth and Life Science 11**

Instructional Materials	Frequency									
	M	%	D	%	CF	%	PF	%	S	%
Textbooks	20	43.5	1	2.2	0	0	24	52.2	1	2.2
Worktext	14	30.4	1	2.2	0	0	31	67.4	0	0
Workbook	14	30.4	1	2.2	0	0	31	67.4	0	0
Module	11	23.9	0	0	0	0	35	76.1	0	0
Manual	13	38.3	1	2.2	0	0	32	69.6	0	0
Worksheet	11	23.9	1	2.2	1	2.2	33	71.7	0	0

Legend: M-MOOE D- Donation

CF- Canteen Fund PF- Personal Funding(Teacher)

S- Student

Instructional materials for the subject, Earth and Life Science for Grade 11 are highly not available. To make ends meet, the teacher assigned to that subject takes the initiative to prepare and produce the instructional materials. For the mass production of these materials as Table 4 reveals, the teacher in-charged is also the one who provided the relative fund. While it is good to learn that some schools allot a part of their MOOE (Maintenance and Other Operating Expenses) for instructional materials, still the government should work hand-in-hand to provide the needed instructional materials for the learners.

[9] emphasized the scantiness of instructional materials is now faced by the facilitators and the learners as well. The teachers are troubled by the supply of the materials needed in their teaching so as the usability of the materials online and from the other sources so as the available materials given by the Department of Education.

Instructional materials perform a crucial role in the educational process because it enhances the academic skills of the students. In the study performed by Dhar and Faize as cited by [6] that aimed to determine the effect of the availability and use of instructional material on academic performance of students in Punjab, Pakistan, it was concluded that less availability and mis-allocation and the deficiency in the use of instructional materials lead to the wastage of resources, the less effectiveness of instructional material and lower academic performance.

This implies that the government must allot funds in the procurement of instructional materials to supplement the curriculum. Teachers must also be resourceful to find out alternate solutions. In this case, teachers are the ones who provide the materials that are not available to maintain a learning environment of the classroom.

**Table 5: Persons In-Charge in the Accreditation of Instructional Materials in Earth and Life Science 11**

Accrediting Personnel (Division Personnel, School Head Teachers)	Frequency	Percentage
YES	14	30.43
	5	10.87
	6	13.04
	3	6.52
NO	32	69.57

Table 5 shows who accredit the instructional materials prepared by teachers. In the lighter side, there are teacher-prepared instructional materials which are accredited by the master teacher, school head or division personnel. But the rest, the instructional materials prepared are not subjected to accreditation.

Kim and Lee [10] discussed a plan for the development of accreditation system for instructional materials and equipment in kindergarten. Instructional materials in early childhood education are enough importance and effectiveness is high. To develop the instructional materials of excellent quality, maintenance, and management a professional certification system is a demand.

Macarandang as cited by [4] of the University of Batangas evaluated a set of modules prescribed for the subject Principles and Methods of Teaching. She deemed it proper to evaluate the modules so that they will become useful and the efforts of the module developer will prove more meaningful.

Ferrer as cited by [4] developed two sets of checklists to test the validity and acceptability of his modular-based workbook in high school Chemistry.

This implies that there must be an accreditation procedure to produce excellent materials. Other teachers who are interested in using the instructional materials must take considerable caution. Likewise, widely use of the instructional materials is not advisable.

**Table 6: Topics for Inclusion in the Proposed Module**

Rank	Topics
1	Earth Materials and Processes
2	Perpetuation Of Life
3	Bioenergetics
4	Natural Hazards, Mitigation, And Adaptation
5	Interaction And Interdependence
6	The Process Of Evolution
7	Origin And Structure Of The Earth
8	How Animals Survive
9	Introduction To Life Science
10	How Plants Survive

Table 6 presents the chapter components of Earth and Life Science for Grade 11 in which the least mastered competencies fall under Earth materials and processes. The curriculum guide for Earth and Life Science 11 listed the following learning competencies for this chapter component: (1) explain how the products of weathering are carried away by erosion and deposited elsewhere; (2) make a report on how rocks and soil move downslope due to the direct action of gravity; (3) explain how the movement of plates leads to the formation of folds and faults; (4) explain how the seafloor spreads and (5) explain how relative and absolute dating were used to determine the subdivisions of geologic time.

Respondents based their answers from the result on the item analysis of the performance appraisal of learners during the first semester of the School Year 2018-2019.



**Table 7.1 Content Validity of the Developed Module in Terms of Objectives**

<b>Evaluators</b>						
<b>Criteria</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>WM</b>
1. Sourced from the K-12 Curriculum Guide in Earth and Life Science 11.	5	5	5	5	5	5.00
1. The objectives are SMART.	5	5	5	5	4	4.80
2. The objectives are relevant to the students' needs.	5	5	5	5	5	5.00
3. The objectives provides self-pacing.	5	5	5	5	4	4.80
4. The objectives emphasized the most important concepts of the subject.	5	5	5	5	5	5.00
<b>Overall Mean: 4.92, Highly Valid</b>						

**Legend:** 4.21-5.00- Highly Valid (HV) 3.41-4.20- Valid (V)

2.61-3.40- Moderately Valid (MV) 1.81-2.60- Fairly Valid (FV)

1.00-1.80- Not Valid (NV)

Table 7.1 shows that the proposed module was described as “Highly Valid” along the five criteria in the objective as evidenced by the overall result which is 4.92.

The objectives were sourced from the K-12 Curriculum Guide in Earth and Life Science for Grade 11 as it was given an average weighted mean (AWM) of 5.00 (Highly Valid); the objectives are SMART (4.80); the objectives are relevant to the students’ needs (5.00);the objectives provides self-pacing (4.80) and the objectives emphasized the most important concepts of the subject (5.00).

Through the validation process, the objectives presented in the proposed module were stated in SMART (Specific, Measurable, Attainable, Realistic, Time bound) way. Moreover, the result affirms the study of Luistro, Bautista and Daguman as cited by [6] that, in teaching, objectives are very important in choosing the appropriate strategies and instructional materials for it to become a worthwhile experience for the students and the teachers as well.

This implies that module is relevant and coincides with the prescribed content standards, learning competencies, performance standards as mandated by the curriculum guide in Earth and Life Science for Grade 11.

**Table 7.2: Content Validity of the Developed Module in Terms of Lessons**

<b>Evaluators</b>						
<b>Criteria</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>WM</b>
1. Align with the K-12 Curriculum Guide in Earth and Life Science 11.	5	5	5	5	5	5.00
2. Vocabulary and examples used are suited to the reading and understanding level of the learners.	5	5	5	5	5	5.00
3. Provide accurate, relevant and relatively up-to date information with real world applications.	3	5	5	5	5	4.60
4. Presented in paragraphs/sentences that are grammatically correct.	4	5	5	5	4	4.60
5. Free of gender, race, religion, or ethnicity bias.	5	5	5	5	5	5.00
<b>Overall Mean: 4.84, Highly Valid</b>						

**Legend:** 4.21-5.00- Highly Valid (HV) 3.41-4.20- Valid (V)

2.61-3.40- Moderately Valid (MV) 1.81-2.60- Fairly Valid (FV)

1.00-1.80- Not Valid (NV)

The validators gave an overall score of 4.84 or “Highly Valid” to the lessons of the module. Criterion one, two and five was rated the highest with an average weighted mean of 5.00 interpreted as Highly Valid. This connotes that the lessons were aligned with the K-12 Curriculum Guide in Earth and Life Science for Grade 11, vocabulary and examples used are suited to the reading and understanding level of the learners and were free of gender, race, religion, or ethnicity bias. Criterion 3 and 4 got the same average weighted mean of 4.60 which is also interpreted as highly valid.

According to Farrant as cited by [11], that the information presented on every visual should be up to date in every aspect. It should be relevant to the topic as well as to learners. Visual aids should be used at the exact time when they will convey the right meaning they intend to convey.

Minnick as cited by [6] stated that content/information that may be included in any instructional materials are the following; simple, has intended outcome, can develop mastery of lesson and within the level of understanding of the students.

This implies that the lessons provided were accurate, relevant and relatively up-to date information with real world applications and presented in paragraphs/sentences that are grammatically correct which the students can easily understand.

**Table 7.3: Content Validity of the Developed Module in Terms of Learning Activities**

<b>Evaluators</b>						
<b>Criteria</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>WM</b>
1. Align with the K-12 Curriculum standards for Earth and Life Science 11.	5	5	5	5	5	5.00
2. Cater to the needs of the individual learners from various skills levels	5	5	5	5	5	5.00
3. Promote the development of HOTS in the learners.	3	5	5	5	5	4.60
4. Encourage manipulation of materials through self- learning or group work.	5	5	5	5	5	5.00
5. Include clear instructions on using tools, equipment, and materials, and on how to use them safely.	4	5	5	5	4	4.60
<b>Overall Mean: 4.84,</b>	<b>Highly Valid</b>					

**Legend:** 4.21-5.00- Highly Valid (HV) 3.41-4.20- Valid (V)

2.61-3.40- Moderately Valid (MV) 1.81-2.60- Fairly Valid (FV)

1.00-1.80- Not Valid (NV)

It is noted from the data gathered that the validators rated “Highly Valid” to the fact that the learning activities were aligned with the K-12 Curriculum standards for Earth and Life Science for Grade 11 (5.00); cater to the needs of the individual learners from various skills levels (5.00); promote the development of HOTS in the learners (4.60); encourage manipulation of materials through self- learning or group work (5.00) and includes clear instructions on using tools, equipment, and materials, and on how to use them safely. On the average, the validator gave an AWM of 4.84 with respect to the learning activities of the module which is interpreted as “Highly Valid”.

[12] stated that instructional materials include self-supporting materials which are used by the teacher to present a complete body of instruction. They make a lesson to become more explicit and interesting. Teaching aids are the prime importance of both dull and bright students.

This implies that the learning activities in the module encourage manipulation of materials through self-learning or group work and have motivational value that develop the interest of the students.

**Table 7.4: Content Validity of the Developed Module in Terms of Instructional Design (7Es Learning Cycle)**

<b>Evaluators</b>						
<b>Criteria</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>WM</b>
1. Align with the K-12 Curriculum Guide in Earth and Life Science 11.	5	5	5	5	5	5.00
2. Encourages students to work (individual or by group) without or minimal direction from the teacher.	5	5	4	5	5	4.80
3. Asks students to explain concepts and definitions in their own words.	5	5	5	5	5	5.00
4. Provides guidance to apply concepts/skills to home, school, and community contexts and activities.	5	5	4	5	5	4.80
5. Allows the development of opinions, judgements, or decisions.	5	5	5	5	4	4.80
<b>Overall Mean: 4.88, Highly Valid</b>						

**Legend:**

**4.21-5.00- Highly Valid (HV)**

**3.41-4.20- Valid (V)**

**2.61-3.40- Moderately Valid (MV)**

**1.81-2.60- Fairly Valid (FV)**

**1.00-1.80- Not Valid (NV)**

It can be gleaned from the table that the validators gave an overall mean of 4.88 with respects to the Instructional Design (7Es Learning Cycle) of the module interpreted as “Highly Valid”.

The table connotes that criterion one and three garnered the highest AWM which is 5.00 interpreted as “Highly Valid”. This denotes that the instructional design (7E Learning Cycle) was aligned with the K-12 Curriculum Guide in Earth and Life Science for Grade 11 and asks students to explain the concepts and definitions in their own words. It was followed by criterion two, four and five with an AWM of 4.80 interpreted also as “High Valid”. This datum indicates that the instructional design (7E Learning Cycle) encourages students to work (individual or by group) without or minimal direction from the teacher, provides guidance to apply concepts/skills to home, school, and community contexts and activities. Thus, allowing the development of opinions, judgements, or decisions.

Ajayi as cited by [11] observed that instructional materials are versatile tools that used in different ways for effective teaching and learning of basic technology. These aids convey facts and ideas in all forms of communication. They offer quite an easy way of presenting information.

He added that instructional materials should help to give correct initial concept, help students to learn more, speed learning processes, provide experiences which are not known before and arouse interest by attracting attention.

This implies that the Instructional Design (7Es Learning Cycle) is effective, motivates and guides the learners as perceived by the evaluators.

**Table 7.5: Content Validity of the Developed Module in Terms of Graphics**

<b>Evaluators</b>						
<b>Criteria</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>WM</b>
1. Motivate and engage the learner to read the lesson.	5	5	4	5	5	4.80
2. Stimulate students' critical thinking.	5	5	5	5	5	5.00
3. Appear near corresponding text and help clarify text.	5	5	4	5	4	4.60
4. Visual images reflect current and local realities.	5	5	4	5	4	4.60
5. Manageable, not overwhelming, visual and print stimuli.	5	5	5	5	4	4.80
<b>Overall Mean: 4.76, Highly Valid</b>						

**Legend:** 4.21-5.00- Highly Valid (HV) 3.41-4.20- Valid (V)

2.61-3.40- Moderately Valid (MV) 1.81-2.60- Fairly Valid (FV)

1.00-1.80- Not Valid (NV)

It could be noted from the data gathered that the experts appraised the graphics of the module as “Highly Valid” as evident by the overall rating of 4.76.

The table shows that the graphics of the module motivates and engage the learner to read the lesson (4.80); stimulates students' critical thinking(5.00),appear near corresponding text and help clarify text (4.60);visual images reflect current and local realities (4.60) and manageable, not overwhelming, visual and print stimuli (4.80).

Bajah cited by [11] emphasized that a good instructional material have motivational value. This is needed so that the interest of the student/users will be developed. This can be achieved through the use of graphics such as pictures, graphs and diagrams.

The data signifies that the graphics motivate, stimulate critical thinking skills, enhance presentation and visualize images that reflect current and local realities.

**Table 7.6: Content Validity of the Developed Module in Terms of Evaluation**

<b>Evaluators</b>						
<b>Criteria</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>WM</b>
1. Summative test items are appropriate and suited to the learning objectives.	5	5	5	5	4	4.80
2. Summative test items are suited to student ability and easily assess what has been learned.	5	5	5	5	4	4.80
3. The evaluation activities are parallel to the objectives of the subject.	5	5	5	5	4	4.80
4. The evaluation activities develop student's critical thinking skills.	5	5	5	5	5	5.00
5. The evaluation activities are varied and appropriate for Grade 11 students.	5	5	5	5	5	5.00
<b>Overall Mean: 4.88, Highly Valid</b>						

**Legend:** 4.21-5.00- Highly Valid (HV) 3.41-4.20- Valid (V)

2.61-3.40- Moderately Valid (MV) 1.81-2.60- Fairly Valid (FV)

1.00-1.80- Not Valid (NV)

The evaluation of the proposed module was rated as Highly Valid by the five experts. This area was given 4.88.

Criterion four and five has the highest AWM of 5.00 interpreted as “Highly Valid”. This implies that the evaluation activities develop student’s critical thinking skills, varied and appropriate for Grade 11 students. It was followed by criterion one, two and three with an AWM of 4.80 also interpreted as “Highly Valid”.

Adeyomo as cited by [11] stated that basic technology involve a lot of simple tests and activities while the students must involve in, at the secondary school level so as to acquire the necessary skills and experiences.

This implies that the summative test items are appropriate and suited to the learning objectives, student ability and easily assess what has been learned and the evaluation activities are parallel to the objectives of the subject.

**Table 7.7: Summary on the Content Validity of the Developed Module in Earth and Life Science 11**

Indicators	Wm	de
1. Objectives	4.92	HV
2. Lessons	4.84	HV
3. Learning Activities	4.84	HV
4. Instructional Design	4.88	HV
5. Graphics	4.76	HV
6. Evaluation	4.88	HV
<b>Overall Mean: 4.85 (HV)</b>		

**Legend:** 4.21-5.00- Highly Valid (HV)      3.41-4.20- Valid (V)

2.61-3.40- Moderately Valid (MV)      1.81-2.60- Fairly Valid (FV)

1.00-1.80- Not Valid (NV)

The developed module was found “High Valid” with an Overall Mean of 4.85. Further, the table reflects that the developed module in Earth and Life Science for Grade 11 had its highest mean in terms of Objectives (WM = 4.92) and its lowest mean in terms of Graphics (WM = 4.76). In all the parameters, the rating was Highly Valid.

This implies that the developed module is an appropriate instructional material that will provide the students independent learning experience and mastery of the lesson. This will also help the teachers minimize time in thinking if problems situations to be solved.

**Table 8.1: Acceptability of the Developed Module in Terms of Objectives**

Evaluators	1	2	3	4	5	6	7	8	9	10	WM
1. Cater to the K-12 Curriculum Guide in Earth and Life Science 11.	5	5	5	5	5	5	5	5	5	5	5.00
2. Are SMART.	5	5	5	5	5	5	5	5	5	5	5.00
3. Relevant to the students’ needs.	5	5	5	5	5	5	5	5	5	5	5.00
4. Provide self-pacing.	5	5	5	5	5	5	5	5	5	5	5.00
5. Emphasize the most important concepts of the subject.	5	5	5	5	5	5	5	5	5	5	5.00
<b>Overall Mean: 5.00, Highly Acceptable</b>											

**Legend:** 4.21-5.00- Highly Acceptable (HA)      3.41-4.20- Acceptable (A) 2.61-3.40- Moderately Acceptable (MA)  
1.81-2.60- Fairly Acceptable (FA)      1.00-1.80- Not Acceptable (NA)

The table above shows the proposed modules are described as “Highly Acceptable” in all the criteria under objectives as evidenced by the overall rating of 5.00.

According to [13], teaching aids or instructional materials should not be used only because they are attractive or because students will like seeing them. Basic technology teachers should have definite objective in mind before thinking of any aid. The objective to be achieved, this is immeasurable and quantifiable outcome. This could be manipulative, informative, or attitudinal which are usually based on a particular domains of learning such as cognitive, affective and psychomotor.

Ogundele as cited by [11] considered teaching aids as an essential part of teaching methods which helps the teacher express its subject concept to the learners promoting students’ performance.

Moreover, [12] added that the nature of subject matter and the objectives to be attained were one of the factors to consider in the use of instructional materials.

This implies that the objectives were sourced from the K-12 Curriculum Guide in Earth and Life Science 11 (5.00); objectives are SMART (5.00); objectives are relevant to the students’ needs (5.00) objectives provides self-pacing (5.00) and objectives emphasized the most important concepts of the subject (5.00).

**Table 8.2: Acceptability of the Developed Module in Terms of Lessons**

<b>Evaluators</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>WM</b>
1. Geared to the K-12 Curriculum Guide in Earth and Life Science 11.	5	5	5	5	5	5	4	5	5	5	4.90
2. Vocabulary and examples used are suited to the reading and understanding level of the learners.	5	5	5	5	5	5	5	5	5	5	5.00
3. Provide accurate, relevant and relatively up-to date information with real world applications.	5	5	5	5	5	5	5	5	5	5	5.00
4. Presented in paragraphs/sentences that are grammatically correct.	5	5	5	5	5	5	5	5	5	5	5.00
5. Free of gender, race, religion, or ethnicity bias.	5	5	5	5	5	5	5	5	5	5	5.00
<b>Overall Mean: 4.98, Highly Acceptable</b>											

**Legend: 4.21-5.00- Highly Acceptable (HA) 3.41-4.20- Acceptable (A)**

**2.61-3.40- Moderately Acceptable(MA) 1.81-2.60- Fairly Acceptable (FA)**

**1.00-1.80- Not Acceptable (NA)**

It is evident on the table that the evaluators gauged all the lessons in the module as “Highly Acceptable” as reflected by the overall rating of 4.98.

Criteria two, three, four and five ascertain that vocabulary and examples used are suited to the reading and understanding level of the learners. Lesson provides accurate, relevant and relatively up-to date information with real world applications. Lessons presented in paragraphs/sentences that are grammatically correct, and free of gender, race, religion, or ethnicity bias. These criteria were rated 5.00 and were interpreted as “Highly Acceptable”. Criterion 1 was rated 4.90 interpreted as “Highly Acceptable” proves that the lessons were aligned with the K-12 Curriculum Guide in Earth and Life Science 11.

Ozorehe as cited by [11] emphasized that instructional materials aids teachers competence and effectiveness of instruction and class control. It makes the learning environment more attractive, appreciable, conducive, bearable and realistic. The learners’ attention is better controlled and sustained.

[11] added that instructional materials should ensure the appropriateness of the materials for his intended learners. The materials should be suitable for their age, experience and intelligence . The legal, safety and ethical aspects of the materials should equally be considered. The materials should not portray any anti- social attitude. They should always be free from any bias, distortion or prejudice.

This implies that the lessons were appropriate to the learners of the Senior High School taking Earth and Life Science subject because lessons presented in paragraphs/sentences are grammatically correct, and free of gender, race, religion, or ethnicity bias.

**Table 8.3: Acceptability of the Developed Module in Terms of Learning Activities**

<b>Evaluators</b>											
<b>Criteria</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>WM</b>
1.Align with the K-12 Curriculum standards for Earth and Life Science 11.	5	5	5	5	5	4	5	5	5	5	4.90
2.Cater to the needs of the individual learners from various skills levels	5	5	5	5	4	5	5	5	5	5	4.90
3. Promote the development of HOTS in the learners.	4	5	5	5	5	5	5	5	4	5	4.80
4. Encourage manipulation of materials through self- learning or group work.	5	5	5	5	5	5	5	5	5	5	5.00
5. Include clear instructions on using tools, equipment, and materials, and on how to use them safely.	5	5	5	5	5	5	5	5	5	5	5.00
<b>Overall Mean: 4.92, Highly Acceptable</b>											

**Legend: 4.21-5.00- Highly Acceptable (HA) 3.41-4.20- Acceptable (A)**

**2.61-3.40- Moderately Acceptable(MA) 1.81-2.60- Fairly Acceptable (FA)**

**1.00-1.80- Not Acceptable (NA)**

Based on the overall rating of 4.92, the evaluators rated the learning activities in the proposed module as “Highly Acceptable”. The learning activities are deemed to be aligned with the K-12 Curriculum standards for Earth and Life Science 11 with the numerical rating of 4.90 (Highly Acceptable). Similarly, the learning activities cater to the needs of the individual learners from various skills levels indicative of the mean 4.90 (Highly Acceptable). The learning activities also promotes the development of HOTS in the learners as evident by the mean of 4.80 (Highly Acceptable). Evaluators considered the learning activities encourage manipulation of materials through self- learning or group work indicative in the mean 5.00 (Highly Acceptable) and include clear instructions on using tools, equipment, and materials, and on how to use them safely with the same mean of 5.00 (Highly Acceptable).

Oladipo as cited by [11] asserted that instructional materials are important tools for enriching, visualizing, simplifying, transmitting and accelerating the teaching and learning processes, thus enhance students’ academic performance.

Moreover, Bajah cited by [11] emphasized that instructional materials promote retention as we can understand from the Chinese proverb that says “what I hear I forget, what I see I remember, what I do I understand”.

This implies that the learning activities in the proposed module were suitable to the learners because the learning activities were games that are popular to them. With the use of varied learning activities students learning would become more meaningful thus encouraging retention.

**Table 8.4: Acceptability of the Developed Module in Terms of Instructional Design (7Es Learning Cycle)**

<b>Evaluators</b>											
<b>Criteria</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>WM</b>
1. Stimulate interest and curiosity on the learner.	5	5	5	5	5	5	4	5	4	5	4.80
2. Encourages students to work (singly or by group) without or minimal direction from the teacher.	5	5	5	5	5	5	5	5	5	5	5.00
3. Asks students to explain concepts and definitions in their own words.	5	5	5	5	5	5	4	5	5	5	4.90
4. Provides guidance to apply concepts/skills to home, school, and community contexts and activities.	5	5	5	5	5	5	5	5	5	5	5.00
5. Allows the development of opinions, judgments, or decisions.	5	5	5	5	5	5	5	5	5	5	5.00
<b>Overall Mean:</b>	<b>4.94, Highly Acceptable</b>										

**Legend:**                    **4.21-5.00- Highly Acceptable (HA)**                    **3.41-4.20- Acceptable (A)**  
**2.61-3.40- Moderately Acceptable(MA)**    **1.81-2.60- Fairly Acceptable (FA)****1.00-1.80- Not Acceptable (NA)**

Based on the overall rating of 4.94 derived from the evaluation made by the group of evaluators, the modules are “Highly Accepted” in terms of instructional design.

This rating is attributed largely on the second, fourth and fifth criterion which states that instructional design encourages students to work (individual or by group) without or minimal direction from the teacher, instructional design provides guidance to apply concepts/skills to home, school, and community contexts and activities and allows the development of opinions, judgements, or decisions which obtained a mean of 5.00 interpreted as “Highly Acceptable”. The table also shows that the instructional design is aligned with the K-12 Curriculum Guide in Earth and Life Science 11 with a rating of 4.80 (Highly Acceptable) and asks the students to explain concepts and definitions in their own words with the obtained rating of 4.90 interpreted as “Highly Acceptable”.

Khalil et al as cited by [4] made use of self- learning modules to facilitate learning of basic science concepts in an integrated medical curriculum. Students positively evaluated their experience using the SLMs. Most of the students indicated that the SLMs improved understanding and facilitated learning basic science concepts. SLMs were reported to allow learner control, to help in preparation from subsequent in-class discussion, and to improve understanding and retention. In conclusion, the use of SLMs in an integrated Basic Science curriculum has the potential to individualize the teaching and improve the learning of basic sciences. Moreover, Ogunranti as cited by [11] noted that, no matter how professional a teacher is, his/her interaction with the students might not yield an effective outcome as compared to teacher that made use of such versatile materials in his/ her teaching.

This implies that the instructional design used in the module encourages students to work, provides guidance and promotes individualized and collaborative learning.



**Table 8.5: Acceptability of the Developed Module in Terms of Graphics**

<b>Evaluators</b>											
<b>Criteria</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>WM</b>
1. Motivate and engage the learner to read the lesson.	5	5	4	5	5	5	4	5	5	4	4.70
2. Stimulate students’ critical thinking.	4	5	5	5	5	5	5	5	5	5	4.90
3. Appear near corresponding text and help clarify text.	5	5	5	5	5	5	5	5	5	5	5.00
4. Visual images reflect current and local realities.	5	5	4	5	5	5	4	5	5	4	4.70
5. Manageable, not overwhelming, visual and print stimuli.	5	5	4	5	5	5	5	5	5	5	4.90
<b>Overall Mean: 4.84, Highly Acceptable</b>											

**Legend:**                    **4.21-5.00- Highly Acceptable (HA)**                    **3.41-4.20- Acceptable (A)**  
**2.61-3.40- Moderately Acceptable(MA)**                    **1.81-2.60- Fairly Acceptable (FA)**  
**1.00-1.80- Not Acceptable (NA)**

It can be gleaned from the table that the proposed module is described as Highly Acceptable in terms of graphics based on the AWM OF 4.84.

Criterion three got the highest numerical rating of 5.00 interpreted as highly acceptable wherein graphics appear near corresponding text and help clarify text. Graphics also motivates and engage the learner to read the lesson with a mean of 4.70 (Highly Acceptable) and stimulate students’ critical thinking with a mean of 4.90 (Highly Acceptable). The visual images reflect current and local realities with a mean of 4.70 (Highly Acceptable) and the graphics were manageable, not overwhelming, visual and print stimuli indicative of the mean 4.90 interpreted as “Highly Acceptable”.

According to [11], pictorial information should be realistically produced to the extent that it will make the same meaning of impression to every learner. It should be well produced. He added that the planning and production of teachings aids, should be carefully carried out to give a deserved impression of good visual. Finally, a good teaching aid will provide adequate interaction.

The results affirm Walzer as cited by [6] it states that instructional materials do not replace face to face interactions with instructors, however illustrations and graphics which are simple could make the lesson livelier. The graphics/design include but not limited to interactive images, animations, narrations, and self-assessments in order to guide students to practice and retain information but rather could motivate, encourage student to apply learned lessons to daily life.

[6] added that one of the effective ways of mastering the lesson is by means of placing graphical representations and illustrations based on the objectives of the lesson to further illustrate the phenomenon.

This implies that the proposed module has an artistic design that could motivate and kindle the attention of learners.

**Table 8.6: Acceptability of the Developed Module in Terms of Evaluation**

<b>Evaluators</b>											
<b>Criteria</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>WM</b>
1. Summative test items are appropriate and suited to the learning objectives.	5	5	5	5	5	5	5	5	5	5	5.00
2. Summative test items are suited to student ability and easily assess what has been learned.	5	5	5	5	5	5	5	5	5	5	5.00

3. The evaluation activities are parallel to the objectives of the subject.	5	5	5	5	5	5	5	5	5	5	5.00
4. The evaluation activities develop student’s critical thinking skills.	4	5	5	5	5	5	5	5	5	5	4.90
5. The evaluation activities are varied and appropriate for Grade 11 students.	5	5	5	5	5	5	5	5	5	5	5.00
<b>Overall Mean: 4.98, Highly Acceptable</b>											

Legend: 4.21-5.00- Highly Acceptable (HA) 3.41-4.20- Acceptable (A)

2.61-3.40- Moderately Acceptable (MA) 1.81-2.60- Fairly Acceptable (FA)

1.00-1.80- Not Acceptable (NA)

The evaluators agree that the evaluations in Pre-test and Post- test are “Highly Acceptable” with an overall rating of 4.98. Specifically, summative test items are appropriate and suited to the learning objectives as reflected in a mean of 5.00 interpreted as “Highly Acceptable”. Summative test items are suited to student ability and easily assess what has been learned has a rating of 5.00 interpreted as “Highly Acceptable”. The evaluation activities are parallel to the objectives of the subject has a mean of 5.00 interpreted as “Highly Acceptable”. The evaluation activities develop student’s critical thinking skills (4.90) and are varied and appropriate for Grade 11 students (5.00) were evaluated as “Highly Acceptable”.

The result also shows that the exercises given are within the capacity of the students suited to the needs and capabilities of the learners which are aligned to the objectives of the lesson. This affirms the citation of o [6] on Arquines and Mendi as he points out that materials should be suitable for actual application to daily life and should useful the capability of the students.

Furthermore, this confirm with the research done by Villadiego and Bautista as cited by [6] that instructional materials should contain exercises and tools based on objectives.

This implies that the evaluation of the module are parallel to the objectives and are appropriate for the Grade 11 Earth and Life Science students.

**Table 8.7: Summary on the Content Validity of the Developed Module in Earth and Life Science 11**

Indicators	Wm	de
1. Objectives	5.00	HV
2. Lessons	4.98	HV
3. Learning Activities	4.92	HV
4. Instructional Design	4.94	HV
5. Graphics	4.84	HV
6. Evaluation	4.98	HV
<b>Overall Mean: 4.94 (HV)</b>		

Legend: 4.21-5.00- Highly Valid (HV) 3.41-4.20- Valid (V)

2.61-3.40- Moderately Valid (MV) 1.81-2.60- Fairly Valid (FV)

1.00-1.80- Not Valid (NV)

It can be gleaned from the table that as a whole, the developed module in Earth and Life Science 11 was found 'Highly Acceptable' with an Overall Mean of 4.94. Further, the table reflects that the developed module had its highest mean in terms of objectives (WM = 5.00) and its lowest mean in graphics (WM = 4.84). In all the parameters, the rating was Highly Acceptable.

The overall acceptability of the developed module has the following components: objectives, lessons, learning activities, instructional design, graphics and evaluation. All the criteria were evaluated to be highly acceptable as evidenced by the overall weighted mean 4.94.

## CONCLUSIONS AND RECOMMENDATIONS

### CONCLUSIONS

1. The teachers of Pangasinan II are challenged by the scantiness of instructional materials for teaching and learning of Earth and Life Science for Grade 11 students.
2. The production of an instructional material in Earth and Life Science is a priority.
3. The developed module is highly credible to be used in public schools as an instructional material.

### RECOMMENDATIONS

1. With the support of all school benefactors, teachers are advised to develop instructional materials.
2. Since modular instruction is appropriate among Senior High School students, this module should be adapted as a supplementary instructional material by the Grade 11 students for the year 2019-2020.
3. Conduct a field study to find out if the developed instructional material will really improve the academic performance of students.

### REFERENCES

1. Tan, M. C. (2009). **Science Education in the Philippines: Where To? UNESCO Education Section**, 85-87. Retrieved September 9, 2017 from <http://unesdoc.unesco.org/images/0019/001914/191425e.pdf>
2. Dy, Jocelyn. (2007). **Strategic Intervention Materials (SIM) in Teaching Physics: Its Effectiveness**. Retrieved May 1, 2019, from <http://jho.blogspot.com/2011/12/strategic-intervention-v-materials-sim-in.html/>
3. Briones, L. (2017). **DepEd: K to 12 is for the Triumph of Filipino Learners**. Retrieved 13 January 2017 from <http://www.deped.gov.ph/press-releases/deped-k-12-triumph-filipino-learners>
4. Abellera, Arlene T. (2013). **Development and Validation of Modules in Grade 7 Science**. Urdaneta City: Pangasinan State University, Graduate School.
5. Rosario, Roselyn D. (2016). **Development and Validation of a Learning Module in Grade 6 Science**. Urdaneta City: Pangasinan State University, School of Advanced Studies.
6. Manzano, Angelo T. (2016). **Development and Validation of a Worktext in Science Grade 8**. Urdaneta City: Pangasinan State University, School of Advanced Studies.
7. Mallorca, M.A. (2017). **Lack of Materials, Facilities and Equipments**. Retrieved May 16, 2019 from <https://projectflawsofeducationsystem.wordpress.com/2017/08/11/lack-of-materials-and-equipment/>
8. Masbaño, N.L. (2016). **Appropriate Interventions on the Problems Encountered on Effective Teaching Practices in a State University External Campus in the Philippines**. Retrieved May 16, 2019 from <https://projectflawsofeducationsystem.wordpress.com/2017/08/11/lack-of-materials-and-equipment/>
9. Basilan, L.C. (2018). **Scantiness of Instructional Materials in Senior High School: Basis for a Proposed Digital Archive**. Retrieved May 16, 2019 from <https://www.apjmr.com>

10. Kim K. C. and Lee M.S. (2014). **The Study on the Development of Accreditation System for Instructional Materials and Equipment in Early Childhood Education.** Retrieved May 17, 2019 from [https://www.researchgate.net/publication/269758280\\_The\\_Study\\_on\\_the\\_Development\\_of\\_Accreditation\\_Sy](https://www.researchgate.net/publication/269758280_The_Study_on_the_Development_of_Accreditation_Sy)
11. Igwe C. C. (2016). **Availability, Utilization and Effect of Instructional Materials in Teaching Basic Technology in Secondary Schools in Onelga, River State.** Retrieved May 17, 2019 from <https://www.researchgate.net/publication>
12. Bakare, G.M. (2006). **Poor Academic Performnace, Aetilogy: Diagnosis and Remediation,** Ibadan: University Press. Retrieved May 17, 2019 from <https://www.researchgate.net/publication>
13. Akolo, J.B. (2001). **Designed and Analyses an Audio-Visual Handbook,** Zaira: Ahmadu, Bello University press Limited. Retrieved May 17, 2019 from <https://www.researchgate.net/publication>