

# DEVELOPMENT AND VALIDATION OF INQUIRY – BASED LEARNING ACTIVITY SHEETS (IBLAS) FOR GRADE 8 TLE ELECTRICAL INSTALLATION AND MAINTENANCE (EIM) STUDENTS

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## ABSTRACT

*This study focuses on the development and validation of an Inquiry-Based Learning Activity Sheets (IBLAS) in Technology and Livelihood Education specializing in Electrical Installation and Maintenance (EIM) for Grade 8 students of Sablayan High School, Division of Sorsogon Province for the School Year 2023 – 2024. The study used the descriptive developmental research design. The respondents of this study were 25 Grade 8 students of Sablayan High School taking Electrical Installation and Maintenance as part of their Exploratory Course for the subject Technology and Livelihood Education and five (5) evaluators who are a graduate of Master's Degree, Master Teachers or Teaching Electrical Installation and Maintenance for three years and above who were purposively chosen. An Evaluator's Validation Tool with a 5-point Likert scale was utilized in this study and the teacher made test (pretest and posttest). Weighted Mean was used in the validation of the developed IBLAS in terms of Content, Format, Presentation and Organization and Accuracy. Moreover, t-test for dependent samples and Cohen's D for the effect size was used to determine the effectiveness of the developed Inquiry – Based Learning Activity Sheets (IBLAS) in improving the academic performance of the students based from the pretest and posttest scores.*

*Based from the data gathered and upon the analysis and interpretation of data, the following findings were revealed: 1. The researcher developed an Inquiry – Based Learning Activity Sheets (IBLAS) intended to Grade 8 students taking Electrical Installation and Maintenance (EIM) as part of their Exploratory Course for the subject Technology and Livelihood Education (TLE). 2. The developed IBLAS by the researcher used an Inquiry - Based Approach as an strategy to developed learners Higher Order Thinking Skills (HOTS) and being contextualized by the researcher. 3. The developed Inquiry – Based Learning Activity Sheets (IBLAS) were validated by five (5) evaluators along Content, Format, Presentation and Organization and Accuracy. The developed Inquiry – Based Learning Activity Sheets (IBLAS) 1,2,3 and 4 were valid along Content with overall average of 4.54, 4.89 along Format, 4.64 along Presentation and Organization and 4.69 along accuracy which is interpreted as very evident. 5. The pretest and posttest computed values are greater than the critical value of 2.064 at a 0.05 level of significance with 24 degrees of freedom. Therefore, the null hypothesis is rejected. This means there is a significant difference in the students' pretest and posttest performance. It also implies that the students' post-test scores are higher than their pretest scores.*

*Based on the findings, the following conclusions were drawn: 1. Inquiry – Based Approach and Contextualization as an strategy to the developed Learning Activity Sheets (LAS) was found effective in Electrical Installation and Maintenance (EIM) in achieving the learning competency. 2. The Inquiry – Based Learning Activity Sheets (IBLAS) as an Instructional Material of teacher so as the learners were considered to be valid along Content,*

*Format, Presentation and Organization and accuracy. 3. There is a significant difference of the result of pretest and posttest that increases the performance of the students upon utilization and exposed to the developed Learning Activity Sheets. 4. The Inquiry – Based Learning Activity Sheet (IBLAS) developed by the researcher is a great tool in improving the academic performance of the students so as the attitude towards the subject and enhances students' interest.*

*The following recommendations were drawn based from the findings and conclusion of the present study: 1. The developed Inquiry – Based Learning Activity Sheets (IBLAS) in Electrical Installation and Maintenance may further enhance and modify in terms of Content and the Flow of Activities based on students' personal experiences for engagement purposes. 2. The developed Inquiry – Based Learning Activity Sheets (IBLAS) may use and incorporate another learning approach to meet 21<sup>st</sup> century learners and skills. 3. The developed Inquiry – Based Learning Activity Sheets (IBLAS) may be used in developing the academic performance of the students and to developed the desired competencies in Electrical Installation and Maintenance. 4. The researcher recommends to further enhance the developed Learning Activity Sheets and covers all the learning outcome in Electrical Installation and Maintenance for Exploratory Grade (7/8). 5. Another study may be conducted to determine the effectiveness on the developed Learning Activity Sheets incorporating Inquiry – Based Learning Approach and Contextualization Learning Strategy.*

**KEYWORDS:** - Development, Validation, Inquiry – Based, Learning Activity Sheets, Technology and Livelihood Education, Electrical Installation and Maintenance, Contextualization, Content, Format, Presentation and Organization, Accuracy, Academic Performance

## INTRODUCTION

The needs for the learners and education of today puts so much pressure to educators all around the world. When COVID – 19 pandemic arises in every country the education system was affected globally. Since education is so pivotal in molding the lives of students, instructional materials create a positive impact in the academic performance of the learners so as the best teaching methodologies used by the teachers in the teaching and learning process. For the positive learning to happen, the necessary tools, appropriate instructional materials, teaching style, strategies and methods must be generated and catered by the teachers.

Instructional material strengthens the result in teaching – learning process and in developing mastery of the learning competency (Olayinka, 2015). Modules and other alternative methods become the partner of teachers all over the world in delivering the lesson and in improving the academic performance of students (Sadiq, 2014). To generate an effective result in education especially in developing the academic performance of students, instructional materials must be generated to cater the ever – changing field of teaching and learning process (Cajayon and Benavides, 2022).

As mentioned by (Oladipo, et. al, 2009), the importance of instructional materials in any teaching and learning process cannot be over emphasized. It is for the fact that such materials enhance, facilitate and make teaching/learning easy, lively and concrete. (Nwachukwu, 2006) stated and cited in the study of (Oladipo, et. al, 2009), that these instructional materials are the devices developed or acquired to assist or facilitate teachers in transmitting an organized knowledge, skills and attitudes to the learners within an instructional situation. Based on the evidences provided by the researchers, instructional material is a great tool in teaching and learning process. Researches proved that the use of instructional material brought about a positive contribution to the academic performance of the learners. It is one method in teaching – learning process to cater the skills needed by the learners of today.

Studies worldwide, that learners of today were considered to be the modern learners because of their habits, dispositions, and their ideas about the ever-changing world in which they lived. These modern learners want to be more exposed to real life situation where they can explore, engaged, investigate, think critically, problem – solved and apply the necessary skills needed of today's generation of education. In connection, according to (Wulandari, 2020) the characteristics of 21<sup>st</sup> century learning includes integrative, holistic, scientific, contextual, thematic, effective, collaborative, and student – centered. In order to equipped learners with these skills, educators should have the knowledge and understanding on the teaching methodologies

and pedagogical approach to be used in teaching and learning process (Fortino, et. al, 2015). Teachers should use the appropriate teaching style, strategies and methods for the positive learning to happen.

The implementation of the K-to-12 Basic Education Curriculum in the Philippines, mandates that each learner must be equipped with the necessary skills (21<sup>st</sup> century skills) that may enable them to use in their future career. In that sense Researches confirmed that Inquiry – Based Approach must be used in the learning process to achieved better result in education. This was supported by Republic Act 10533 also known as the Enhanced Basic Education Act of 2013 stated in Section 5: Curriculum Development (e): The curriculum shall use pedagogical approaches that are constructivist, inquiry – based, reflective, collaborative and integrative.

Nonetheless, there are some issues and problems encountered by educators especially teaching Electrical Installation and Maintenance under Technology and Livelihood Education subject for Exploratory. To note, instructional materials and necessary tools needed in teaching is one of them that may affect to academic performance of students especially in developing 21<sup>st</sup> century learners and quality education.

(Barcelona, K. E., et. al., 2023) stated that TLE Teachers encountered challenges when it comes to learning resources. They mentioned that one issue that they faced was the limited resources available to the learners. The study proved that TLE Teachers often struggling with outdated equipment, insufficient tools and materials. This was also supported by (Cajayon and Benavides, 2022), that the issue of insufficient instructional materials and teaching tools that are aligned with Department of Education's prescribed learning outcomes is considered to be the problems. Due to this challenge, educators find it difficult to teach and cater the necessary learning competency needed by learners and needs to be addressed.

In Bicol Region, there were 76, 000 students having difficulties in grasping the lessons especially in reading mentioned by DepEd – Bicol Regional Director Gilbert Sadsad (GMA News Online, 2020). This problem caused by outdated reference materials, books and lack of instructional material. In addition, TLE teachers in Sorsogon Province find it difficult to achieved a quality learner because of some issues encountered by them. These issues, concerns and problems includes no library or updated books to use and borrow mostly in TLE, lack of tools needed in the learning process and access to internet to some schools are not evident especially in remote and isolated barangays in the province that greatly impacted and resulted to poor academic performance of the learners. Therefore, it is important for the students to have such reference materials to enhance their academic performance in the subject.

The present school where the researcher assigned has low internet connectivity, the school has no library and lack of instructional materials like books and even tools needed in the learning process is actually the problems encountered since it was newly established public secondary school and the only island barangay located in the Municipality of Juban, Sorsogon. Sablayan High School as newly established public secondary school has an enrollee of 25 Grade 8 EIM students as part of their Exploratory Course in Technology and Livelihood Education subject. Problems mentioned above were experienced by the learners that affected their performance in the school. Students rely the information and knowledge to teachers, since unavailability of books is the problem of the school so as the low internet connectivity. As a result, their academic performance to the subject affected badly.

With the creation of modules, Learning Activity Sheets and other alternatives as mandated by DepEd (DepEd Memo no. 48 s. 2020) will be very helpful to learners and teachers in achieving the learning competencies and might addressed these problems encountered by learners and teachers. That is why, the researcher come up with this study to help the community and the school elevate the quality of education among learners.

## **OBJECTIVES**

This study aimed to develop and validate an Inquiry - Based Learning Activity Sheets (IBLAS) in Technology and Livelihood Education specializing in Electrical Installation and Maintenance (EIM) for Grade 8 students. Specifically, it sought answers to the following questions:

1. What Inquiry – Based Learning Activity Sheets (IBLAS) may be developed along with the following topics:
  - a. Select Measuring Tools and Instruments;
  - b. Carry Out Measurement and Calculations;
  - c. Analyze Signs, Symbols and Data;
  - d. Interpret Technical Drawings and Plans?
2. What are the features of the developed Learning Activity Sheets (LAS) in terms of:
  - a. Inquiry – Based;
  - b. Contextualization?

3. What is the validity of the developed Inquiry – Based Learning Activity Sheets (IBLAS) along:
  - a. Content;
  - b. Format;
  - c. Presentation and Organization;
  - d. Accuracy?
4. How effective is the developed Inquiry – Based Learning Activity Sheets (IBLAS) in improving the academic performance of the students?

### **METHODOLOGY**

The study aimed to develop and validate an Inquiry - Based Learning Activity Sheets (IBLAS) in Technology and Livelihood Education specializing in Electrical Installation and Maintenance (EIM) for Grade 8 students. Generally, descriptive-developmental research method is the design in which this study was anchored.

According to Dr. Y.P. Aggarwal (2008) as cited by Salaria, (2012) that Descriptive Research is devoted to the gathering of information about prevailing conditions or situations for the purpose of description and interpretation. This study is descriptive because it described the following: (a.) developed Inquiry – Based Learning Activity Sheets (IBLAS), (b.) the features of the developed IBLAS, (c.) evaluators' validation on the developed IBLAS and (d.) the effectiveness of the developed IBLAS in improving the academic performance of the students.

Richey & Klein, (2014) and cited by Arevalo, C.M.J., Janer, S.S., & Ricafort, J.D., (2023), that Developmental Research is a study that develops, design and evaluate programs, processes and learning that requires meeting validity, practicality and effectiveness criteria. This study is also a developmental because it developed an Inquiry - Based Learning Activity Sheets (IBLAS) for Grade 8 under Technology and Livelihood Education subject specializing in Electrical Installation and Maintenance (EIM) because it utilized the ADDIE Model in the development and validation of the IBLAS.

A Purposive Sampling Method was used by the researcher in selecting the twenty – five (25) Grade 8 EIM students of Sablayan High School as the main respondents and five (5) evaluators who checked and validated the developed IBLAS depending on their length of service, position and academic background. Moreover, the teacher made test served as pretest and posttest to Grade 8 EIM students was used by the researcher to determine how effective the developed IBLAS in the performance of the students. Likewise, the study made use of checklist questionnaire for the validation of the IBLAS.

Furthermore, weighted mean was used for the validation as statistical tool and t-test for dependent samples and Cohen's D for the effect size was used.

### **RESULT AND DISCUSSION**

#### **FINDINGS:**

Based from the analysis and interpretation of data, the following findings were drawn:

1. The researcher developed an Inquiry – Based Learning Activity Sheets (IBLAS) intended to Grade 8 students taking Electrical Installation and Maintenance (EIM) as part of their Exploratory Course for the subject Technology and Livelihood Education (TLE) with the following topics: Select Measuring Tools and Instruments; Carry Out Measurement and Calculations; Analyze Signs, Symbols and Data; and Interpret Technical Drawings and Plans.
2. The developed LAS by the researcher used an Inquiry - Based Approach as an strategy to developed learners Higher Order Thinking Skills (HOTS) and being contextualized by the researcher.
3. Basically, the developed Inquiry – Based Learning Activity Sheets (IBLAS) were validated by five (5) evaluators who are a graduate of Master's Degree, Master Teachers or Teaching Electrical Installation and Maintenance for three years and above along Content, Format, Presentation and Organization and Accuracy. The developed Inquiry – Based Learning Activity Sheets (IBLAS) 1,2,3 and 4 were valid along Content with overall average of 4.54, 4.89 along Format, 4.64 along Presentation and Organization and 4.69 along accuracy which is interpreted as very evident.
4. The Pretest and Posttest computed values are greater than the critical value of 2.064 at a 0.05 level of significance with 24 degrees of freedom. Therefore, the null hypothesis is rejected. This means there is a

significant difference in the students' pretest and posttest performance. It also implies that the students' posttest scores are higher than their pretest scores.

### CONCLUSIONS:

Based on the findings, the researcher come up with the following conclusions:

1. Inquiry – Based Approach as an strategy to the developed Learning Activity Sheets (LAS) was found effective in Electrical Installation and Maintenance (EIM) to the topics Select Measuring Tools and Instruments; Carry Out Measurement and Calculations; Analyze Signs, Symbols and Data; and Interpret Technical Drawings and Plans in achieving the learning competency.
2. The Inquiry – Based Learning Activity Sheets (IBLAS) as an Instructional Material of teacher so as the learners were considered to be valid along Content, Format, Presentation and Organization and accuracy.
3. There is a significant difference of the result of pretest and posttest that increases the performance of the students upon utilization and exposed to the developed Learning Activity Sheets.
4. The Inquiry – Based Learning Activity Sheets (IBLAS) developed by the researcher is a great tool in improving the academic performance of the students so as the attitude towards the subject and enhances students' interest.

### RECOMMENDATIONS:

The following recommendations were drawn by the researcher based from the findings and conclusion of the present study.

1. The developed Inquiry – Based Learning Activity Sheets (IBLAS) in Electrical Installation and Maintenance may further enhance and modify in terms of Content and the Flow of Activities based on students' personal experiences for engagement purposes.
2. The developed Inquiry – Based Learning Activity Sheets (IBLAS) may use and incorporate another learning approach to meet 21<sup>st</sup> century learners and skills.
3. The developed Inquiry – Based Learning Activity Sheets (IBLAS) may be used in developing the academic performance of the students and to developed the desired competencies in Electrical Installation and Maintenance.
4. The researcher recommends to further enhance the developed Learning Activity Sheets and covers all the learning outcome in Electrical Installation and Maintenance for Exploratory Grade (7/8).
5. Another study may be conducted to determine the effectiveness on the developed Learning Activity Sheets incorporating Inquiry – Based Learning Approach and Contextualization Learning Strategy.

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