

# Research O'clock: Experiences of Science, Technology, Engineering and Mathematics Students of Mangaldan National High School SY 2018-2019 in Research

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## **Abstract**

Research is one of the feared subjects of both students and teachers. This study is conducted to narrate the experiences and journey of the G12 STEM Students in Research. There were collaborations among teachers in Practical Research 2 and Inquiries, Investigation, & Immersion to maximize the time and other resources. Worksheets are crafted by the Teachers and utilized by the STEM students. Evaluation of the worksheet used the following parameters: clarity, content, teacher-factor and student-factor. The advantages, disadvantages, difficulties and changes to be made; and the overall reaction on the Worksheets were also included in the evaluation. Also, reflection journals were written by students regarding their experiences and their impressions on the Teachers. As a result, the Worksheets are rated as excellent in terms of clarity, content, teacher-related aspect and student-related aspect. Worksheets made the writing of each research chapter easier. But because Worksheets are provided, being absent in class turned okay for students. Difficulties in answering the Worksheets were due to language and terminologies used. Further, it was affirmed that sincere and compassionate Teachers are needed to cultivate and enrich the inquisitive and intelligent minds of the STEM students in studying and applying research in daily life.

**Keywords:** *Practical Research; Evaluation of Research Worksheets; Inquiries, Investigation, & Immersion*

## **I. INTRODUCTION**

Research is one of the contextualized subjects of the senior high school curriculum that is taken as three (3) subjects taken in 3 semesters; Practical Research 1, Practical Research 2 and Investigation, Inquires and Immersion. Topics in this subject include Nature and Inquiry of Research; Identifying the Inquiry and Stating the Problem; Learning from Others and Reviewing the Literature; Understanding Data and Ways to Systematically Collect Data; Finding Answers through Data Collection; and Reporting and Sharing Findings.

According to Sumio Iijim, as cited by EM Albay in 2017, research can be undertaken in any kind of environment, as long as you have the interest. In Practical Research 2, the challenge is not actually encouraging the students to have an interest on something but encouraging the students to have interest on the subject itself. It is one of the feared

subjects. Teachers, also, are having difficulties in teaching the subjects since Research as a Subject were taken during college and few are undergoing graduate studies and in most seminars it is assumed that participants already have backgrounds in Research. According to many, also cited by EM Albay in 2017, research is a sign of intelligence.

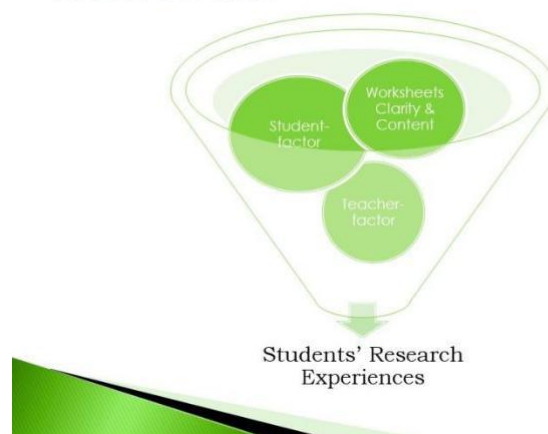
It is the teacher's responsibility to deliver the curriculum and administer the teaching-learning process even such subject is feared and difficult to teach. Aside from the difficulty in delivering the lessons itself; there is a perennial problem of tardiness and absenteeism among senior high school students. Since STEM students have the most number of subjects which equates to more workload on them. With this, Worksheets had been a solution. Worksheets 1 to 8 was developed and is used in the Practical Research 2 class of students in Science, Technology, Engineering and Mathematics (STEM). Worksheet 1 is about Chapter I

(Introduction) which included Background of the Study, Objectives of the Study, Statement of the Problem, Significance of the Study, Scope and Delimitation and Definition of Terms. Worksheet 2 is about Chapter 2 (Review of Related Literatures and Studies) which includes Related Literatures, Related Studies, Legal Bases, Formulation of Conceptual Framework and Listing of References. Worksheet 3 is the formulation of Null Hypothesis. Worksheet 4 is the Methodology which includes Research Design, Sampling and Sampling Technique, Data Gathering and Data Analysis. Worksheet 5 includes enumeration of Data and Sources of Data. Worksheet 6 includes Findings and Discussions. Worksheet 7 includes Findings, Conclusions and Recommendations. And Worksheet 8 is on the formulation of the Abstract. As cited by Chi-Di Lee (2014), Worksheets have been used in teaching for a long time. In modern time, Worksheets have even become a driving force of curriculum in some countries. Teachers use Worksheets for the purpose of supporting studying and promoting active learning, raising interest in learning science, and assessment. Many studies suggest that well-designed Worksheets have positive impact on the students learning achievement (Sasmaz-Oren & Ormaci, 2012). However, researchers observed that there were many inappropriately designed and misuse Worksheets that hinder learning (Lesley & Labbo, 2003.) Therefore, it is also the responsibility of the teacher to check if the Worksheets are acceptable to the students.

This study aims to document the experiences of the STEM students towards Research and to evaluate the acceptability of Worksheets used by students in Practical Research 2. Specifically, it aims to evaluate the Worksheet in terms of Kalinawan (Clarity and Understanding); Nilalaman (Content); Mga Aspetong may kinalaman sa Guro (Teacher Factor) and Mga Aspetong may kinalaman sa Mag-aaral (Student Factor); determine the advantages and disadvantages of the use of Worksheet; determine the difficulties encountered by the students in answering the Worksheets; determine the aspects to be improve on the Worksheets; and determine the reaction of the students on the Worksheets

This study shall be used as basis for further utilization and improvement of the Worksheets used in Practical Research 2. It may also become a basis for recommending the continual utilization of the Worksheets.

## Framework



## II. METHODOLOGY

This is an Action Research study which aims to document the experiences of the STEM Students in Research and to assess the utilization and acceptability of the Worksheets in Practical Research 2. An Action Research uses qualitative and quantitative data for individuals to study education problems that they face in their setting (Creswell, 2012).

The Worksheets were created by the Teacher-Researcher and utilized by the Senior High School Students of Mangaldan National High School in P. De Guzman St., Mangaldan, Pangasinan during the SY 2018-2019. Evaluation survey was conducted in March 2019.

There were one hundred four (104) students who utilized the Worksheet and there were eighty-nine (89) respondents for the said study. This study shall use Worksheets and Evaluation Sheets to gather data on the acceptance of the students on the Worksheets in Practical Research 2. Also, written feedback was gathered through the Reflection Journals written by the students.

The data was manually encoded in the SPSS v. 20. Mean of each variable/ indicator was computed

while the descriptive rating was determined using VLOOKUP in Microsoft Excel. Analysis and coding of Reflection Journals written by the students was also done by the Teacher-Researcher.

Percentage and mean were computed. The mean shall be interpreted using the following Likert scale: Excellent (Pinakamahusay) 3.4 to 4; Good (Mahusay) 2.6-3.3; Fair (Hindi Gaanong Mahusay) 1.8 to 2.5 and Needs Improvement (Nangangailangan ng pagsasaayos) 1 to 1.7.

### III. RESULTS

#### Worksheets as Research Maps

According to former Special Science Class students, it was their first time to use Worksheets in Research. With this, creating Research became much easier. Worksheets are very useful as if it minimizes the work on the given Chapter. Worksheets serve as pattern for students while working on their research project. The Worksheets provided clear instructions.

The Worksheets provided systematic, step by step procedure on how to proceed with the Research Project. Worksheets became a very important guideline for students. The Worksheets made Research Project cost less since the students are provided with it and there is no need to print and reprint the whole manuscript. Answering Worksheets was difficult and taxing at first, then it was realized that it was effective and efficient for the students-learning. Worksheets helps the students to become concise, direct to the point and comprehensive in answering the question of the Worksheet and doing the Research Project.

#### The Teacher as Guiding Light to Young Researchers

According to the STEM students, the research subject gives less pressure. The Teacher gives clear and concise answers to questions in order for the students to answer. The Teacher always cites examples on how to live life with passion and intellect.

#### Overcoming Fear

According to one of the students, Research is the most feared and hated subject in the Senior High School...but it became a not so complicated subject. The student was challenged and in the end she said “trust me, it will be all worth it” The use of worksheet “opens up better perspective in Research.”

#### Open House Research Forum

According to some students, they enjoyed the Open House Research Forum since they are allowed to interact with the Panel and eat snacks with them. Most of the Panel members give motivations and constructive comments.

#### Evaluation of Worksheets

Indicators	Mean	Descriptive Rating
Clarity	3.72	Excellent
Content	3.75	Excellent
Teacher-related Aspects	3.70	Excellent
Students-related Aspects	3.62	Excellent
Overall Average	3.69	Excellent

Criteria	Indicators	Frequencies	Percentages
Advantages	<i>Napapadali ang pagsusulat ng bawat kabanata ng Pananaliksik</i>	85	97.70
	<i>Nagkaroon ng tamang direksyon ang Pananaliksik</i>	70	80.50
Disadvantages	<i>Nawiwiling lumiban sa klase</i>	40	46.00
Difficulties	<i>Sa mga terminolohiya</i>	32	36.80
	<i>Pagsusulat (handwriting)</i>	29	33.30
Changes	<i>Dagdagan ang direksyon sa bawat seksyon ng Worksheet</i>	47	54.00
	<i>Lagyan ng paliwanag ang Worksheet</i>	41	47.10

### Over-all Reactions on the Worksheets

Indicators	Frequencies	Percentages
Masaya	79	91.9
Madali	64	73.6
Nakakapanabik	47	54
Nakakataas ng tiwala sa sarili	54	62.1

## IV. DISCUSSIONS

According to the respondents, the Worksheets were excellent in terms of clarity, content, teacher related aspect and student related aspects. But these could still be improved to facilitate the culture of research among young students.

On the advantages, almost all responded that writing each chapter of the research was made easier. On the disadvantage, almost half responded that they became fond of not attending classes since Worksheet are still available even if they don't go to school. But this goes hand in hand with the difficulties of answering the Worksheets by some of the students since they did not attend the discussion. While some are having the difficulties in answering the Worksheet due to the Language and terminologies used.

Majority of the students have positive reaction and acceptance on the Worksheets since they are happy, made their research subject easier, exciting and increased their self-confidence. Also gives them the will and encouragement to finish their research.

## V. CONCLUSIONS

With the findings of the study, the following are concluded:

1. The authentic and sincere instructions and teaching helps in accomplishment of Research projects thereby developing soft skills among STEM students.
2. Students can develop their interest in Research and also on their field on interest.
3. The Worksheets were excellent but they can be improved to truly help the students and not to hinder their learning and love for Research.

4. Worksheets could minimize time for generating ideas. Time saved can be spent in equally worthwhile activities.
5. Giving electronic copies of Worksheets and encoding made it easier for the students and at lesser cost on the part of the Teacher.

## VI. RECOMMENDATIONS

Based on the Findings of these study the following are highly recommended:

1. Teachers may continually attend seminars and workshops to find ways to generate ideas and nurture the research abilities from young minds.
2. Further improvements in the Worksheets and development of Research Modules is also recommended.
3. Worksheets must be available online for interested students and Teachers.

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