**Literacy Level of STEM Students in Conducting Research**

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**A Research Paper**

**Presented to**

Maricel Amiler

In Partial Fulfillment of the Requirement on Practical Research

**Presented by**

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**Chapter 4**

**Presentation, Analysis and Interpretation of Data**

This chapter deals with the presentation, interpretation, and analysis of all the data gathered in answering the questions to the survey related to the “Literacy level of STEM students in conducting research”.

**Table 1.** Age of STEM Students

|  |  |  |
| --- | --- | --- |
| **Age Frequency Percentage** | | |
| **Below-15**  **16-17**  **18-19**  **20- Above**  **OVERALL TOTAL** | 1  45  6  0  **52** | 1.92  86.54  11.54  0  **100** |

Table 1 shows the distribution of stem student respondents according to age. The table reveals that the majority of the respondents, 86.74 percent are 16-17 years old. This implies that most of the respondents are teenagers with the capacity to comprehend and enhance one's literacy level in conducting research. According to Barrett & Ridell (2019), the relationship between ageing and literacy skills is of growing importance because of several interrelated development, such as conducting research.

**Table 2.** Gender of STEM Students

|  |  |  |
| --- | --- | --- |
| **Gender Frequency Percentage** | | |
| **Male**  **Female**  **LGBTQ**  **OVERALL TOTAL** | 24  27  1  **52** | 46.15  51.92  1.2  **100** |

Table 2 presents the distribution of gender among STEM students. The data reveals that the majority of the class comprises females, accounting for 51.92% of the total students (27 students) compared to 46.15% males (24 students), out of a total of 54 students. This suggests that a significant proportion of the respondents are mostly females. Martinez et al. (2020) suggest that female-dominated classrooms may provide a supportive environment for the development of research skills, as they often prioritize collaborative learning in conducting research and inclusive teaching practices.

**Table 3.** Religion of STEM Students

|  |  |  |
| --- | --- | --- |
| **Religion Frequency Percentage** | | |
| **Islam**  **Roman Catholic**  **SDA**  **INC**  **Jehovah’s Witness**  **Mormons**  **Pentacostal**  **Orthodox** | 13  29  2  1  0  0  1  0 | 25  55.77  3.85  1.92  0  0  1.92  0 |
| **Born Again** 6 11.54 | | |
| **NA**  **OVERALL TOTAL** | 0  **52** | 0  **100** |

*Continuation of Table 3*

Table 3 presents the religion of STEM students. The table reveals that among 52 students, 25 percent (13 students) are Islams, 55.77 percent (29 students) are Roman Catholic, 3.84 percent (2 students) are SDA, 1.92 percent (1 student) is INC, 1.92 percent (1 student) is Pentecostal, and 11.54 percent (6 students) are Born Again. This implies that majority of the students are comprises of Roman Catholics compared to other religions for the reason that Roman Catholics has greater population in our community than the other religions. Nevertheless, despite the religions where students belong, their comprehension of literature remains at the same level and their religion does not measure their literacy level in conducting research. According to Dale Tuggy (2013), “all” the religions are right to the same degree

**Table 4.** Relationship Status of STEM Students

|  |  |  |
| --- | --- | --- |
| **Relationship Status Frequency Percentage** | | |
| **Single**  **In a Relationship**  **Complicated**  **Open Relationship**  **OVERALL TOTAL** | 40  9  3  0  **52** | 76.92  17.31  5.77  0  **100** |

The figure presents the relationship status of STEM students. The figure shows a large number of the students, 40 or 76.92 percent, are single. This implies that the majority of the students do not experience romantic relationship issues, which shows that most of the respondents are less distracted and can allot more time in enhancing one's literacy level in conducting research. Myers (2010) stated that romantic relationships consume a lot of time for students which may hinder their potential to enhance their literacy level in conducting research.

**Table 5.** JHS Curriculum of STEM Students

|  |  |  |
| --- | --- | --- |
| **JHS Curriculum Frequency Percentage** | | |
| **STEP**  **Basic Education**  **Open High**  **ALS**  **Journalism**  **Sports**  **SPED**  **Foreign Language**  **Arts**  **OVERALL TOTAL** | 11  32  0  0  5  1  0  0  3  **52** | 21.15  61.54  0  0  9.62  1.92  o  o  5.77  **100** |

Table 5. shows the distribution of the junior high school curriculum for STEM students.

The table reveals that many of the respondents, 32, or 61.54%, are from basic education,

followed by 11 or 21. 15 percent belong to STEP, or Science, Technology, and Engineering Program; 5 or 9.62 percent of the respondents are from journalism; and 3 or 5.77 percent belong to art. This indicates that the majority of the STEM students are from the Basic Education Curriculum. According to Antra Harve (2023), curriculums equips students with the knowledge, skills, and literacy they need to succeed academic. Furthermore, curriculum can enhance one's literacy level in any aspect in fields like research and mathematics.

**Table 6.** Working Status of STEM Students

|  |  |  |
| --- | --- | --- |
| **Working Status Frequency Percentage** | | |
| **Working**  **Not Working**  **OVERALL TOTAL** | 4  48  **52** | 7.69  92.31  **100** |

Table 6 presents the Working Status of STEM Students. The table shows that 48 or 92.31 percent of the students are not working. This means that a small fraction of STEM Students are currently employed while the majority are not employed in work at the moment. As cited in Shoeboxcampaign Economic constraints often force Filipino students into the workforce early on. As a result, the current landscape sees a lot of students engaged in part-time or full-time work alongside their studies – making it difficult for students to juggle all at once.

**Table 7.** Father’s Highest Educational Attainment of STEM Students

|  |  |  |
| --- | --- | --- |
| **Father’s Highest Educational Attainment Frequency Percentage** | | |
| **N/A**  **Deceased**  **Elementary Level**  **Elementary Graduate**  **High School Level**  **High School Graduate** | 9  0  0  1  1  7 | 7.31  0  0  1.92  1.92  13.46 |
| **College Level**  **College Graduate**  **Master’s Units Earner**  **Master’s Graduate**  **PhD Units Earner**  **PhD Graduate**  **Vocational Skills Earner**  **Vocational Skills Graduate**  **OVERALL TOTAL** | 7  20  1  3  0  0  2  1  **52** | 13.46  38.46  1.92  5.77  0  0  3.85  1.92  **100** |

*Continuation of Table 7*

The table exhibits the distribution of father's highest educational attainment of STEM students. The table reveals that the majority of STEM students father's highest educational attainment, 20 or 38.46 percent are college graduates. This indicates that STEM students' father's highest educational attainment might have stronger influence on their literacy level when conducting research compared to parents who passed below the level of college graduate. According to the study of Hoferichter and Raufelder (2019), they suggested that the relationship between adolescents' STEM achievement and parental pressure/support is rather mono-directional than bi-directional over time.

**Table 8.** Mother’s Highest Educational Attainment of STEM Students

|  |  |  |
| --- | --- | --- |
| **Mother’s Highest Educational attainment Frequency Percentage** | | |
| **N/A**  **Deceased**  **Elementary Level** | 2  0  0 | 3.85  0  0 |
| **Elementary Graduate**  **High School Level**  **High School Graduate**  **College Level**  **College Graduate**  **Master’s Units Earner**  **Master’s Graduate**  **PhD Units Earner**  **PhD Graduate**  **Vocational Skills Earner**  **Vocational Skills Graduate**  **OVERALL TOTAL** | 1  3  8  14  17  2  4  0  0  0  1  **52** | 1.92  5.77  15.38  26.92  32.64  3.83  7.69  0  0  0  1.92  **100** |

*Continuation of Table 8*

Table 8 displays the distribution of STEM students' mothers' highest educational attainment. The table reveals that the largest proportion, 32.69%, of STEM students' mothers are college graduates. This implies that the literacy level of STEM students in conducting research may be significantly influenced by their mothers' educational achievements, particularly those who have attained a college degree. As cited in the study by Hoferichter and Raufelder (2019), there is evidence to suggest that parental educational background plays a crucial role in shaping adolescents' literacy level and academic achievements, as well as in conducting research.

**Table 9.** Father’s Occupation of STEM Students

|  |  |  |
| --- | --- | --- |
| **Father’s Occupation Frequency Percentage** | | |
| **Unemployed**  **Deceased**  **Gov’t Employee**  **Self-Employed**  **Private Employee**  **OFW**  **N/A**  **OVERALL TOTAL** | 4  1  9  14  11  5  8  **52** | 7.69  1.92  17.31  26.92  21.15  9.62  15.38  **100** |

Table 9 presents the distribution of STEM students' fathers' occupations. The table shows that the majority of STEM students' fathers are self-employed, containing 26.92% of the total. This suggests that a significant amount of STEM students come from families where the father is self-employed, indicating access to resources or support that could enhance their child's research conducting skills. According to Thomas et al., (2020), parent involvement positively influences STEM learning outcomes, bridging potential resource gaps and enhancing skill in conducting research.

**Table 10.** Mother’s Occupation of STEM Students

|  |  |  |
| --- | --- | --- |
| **Mother’s Occupation Frequency Percentage** | | |
| **Housewife**  **Deceased**  **Gov’t Employee** | 17  1  14 | 32.69  1.92  26.92 |
| **Self-Employed**  **Private Employee**  **OFW**  **N/A**  **OVERALL TOTAL** | 3  7  3  3  **52** | 13.46  13.46  5.77  5.77  **100** |

*Continuation of Table 10*

Table 10 shows the distribution of the STEM student's mother occupations. The table reveals that majority of the respondents, 17 or 32.69 percent mothers are housewife. This indicates the majority of the STEM students come from a family where mother is housewife, it implies a great potential to access and enhance child literacy in research. As stated by Sunendar (2022), Mother’s education have a abilities to positively correlated with learners’ language and literacy learning opportunities. Furthermore, mother's occupation has a potential possibility of impact in the growth of skills in the literacy level in conducting studies in research.

**Table 11.** Parent’s Monthly Income of STEM Students

|  |  |  |
| --- | --- | --- |
| **Parent’s Monthly Income Frequency Percentage** | | |
| **Below-10,000**  **10,001-20,000**  **20,001-30,000**  **30,001-40,000**  **40,001-50,000**  **50,001-above**  **OVERALL TOTAL** | 5  14  11  6  6  10  **52** | 9.62  26.92  21.15  11.54  11.54  19.23  **100** |

Table 11 shows the parent's monthly income of STEM students. The figure reveals that 26.92 percent of the parent's of the respondents has a monthly income of 10,001- 20,000, 21.15 percent of the respondent's parents earns 20,0001- 30,000, 19.23 percent earns 50,001-above, 11.54 percent earns 30,001-40,000 and 40,001-50,000, and 9.62 percent earns below-10,000. This implies that majority of the parent's monthly income of the respondents is 10,001-20,000, which is a great factor in determining its impact towards the literacy level of STEM students in conducting research. According to Ghaus, et al. (1996) As the monthly income increased the level of achievement was increased as well. People having higher incomes had a high level of literacy achievement. Clark (2015) presented the same results in their studies. The same was the matter with the literacy skills of the students in conducting research.

**Table 12.** Factors that Affect in Conducting Research Among STEM Students

|  |  |
| --- | --- |
| **Factors Frequency** | |
| **Time Management**  **Laziness**  **Reading Comprehension**  **Lack of Motivation**  **Family Situation**  **Lack of Resources**  **Financial Problem**  **Manipulation of Data**  **Honesty to the Research**  **Others** | 52  42  2  29  9  31  31  17  7  1 |

The data from the table illuminates the various factors influencing the research endeavors of scientific literacy of STEM students in conducting research STEM students. Among the 52 respondents, 100 percent identify time management as a primary challenge. Additionally, 80.77 percent of the respondents, totaling 42 individuals, acknowledge struggling with laziness in their research pursuits. Reading comprehension poses difficulties for a smaller fraction, with 3.85 percent (2 students) encountering such challenges. Lack of motivation impacts 55.77 percent (29 respondents), while financial problem and lack of Resources 59.62% (31 students). Family-related problem concern 17.31 percent (9 students), while 32.69 percent (17 students) face data manipulation hurdles. Honesty to the Research are cited by 13.46 percent (7 students), and other reasons are mentioned by approximately 1.92 percent(1 student) of the respondents. These findings underscore the paramount importance of effective time management skills in bolstering the scientific literacy of STEM students. As stated by Escalona (2020) identifying difficulties such as literature search, cooperation, and deficient time management skills among students can have detrimental effects on both their personal lives and academic pursuits, which means poor time management not only hampers academic performance but also underscores the importance of enhancing students' time management abilities to alleviate stress and improve overall well-being and literacy level in conducting research effectively.

**Table 13.** Literacy Level in Conducting Research

|  |  |  |
| --- | --- | --- |
| **Statements**  x̄ **[Mean] Qualitative Description** | | |
| **I know how to write in:**  **Introduction**  **Conceptual and theoretical framework** | 3.56  3.12 | **Very Good**  **Very Good** |
| **statement of the problem**  *Continuation of Table 13*  **Objectives**  **Significance**  **scope and limitations**  **definition of terms**  **review of related literature and studies**  **Research design**  **Research environment/locale of the study/sampling area**  **Respondents and sampling procedures**  **Data gathering procedures**  **Research instrument(s) and its validation**  **Statistical tools used/statistical treatment/treatment o data**  **Results and discussions**  **Summary, findings, conclusions and recommendations**  **abstract**  **references**  **I know how to:**  **Tally and organize data in the table**  **Analyze and interpret data on the table**  **Properly cite the authors**  **Conduct experiment**  **Use the different statistical tools applicable to a certain research.** | 3.40  3.58  3.62  2.98  3.79  3.46  3.15  3.06  3.19  3.29  3.04  2.85  3.54  3.79  3.12  3.60  3.69  3.69  3.73  3.21  2.85 | **Very Good**  **Very Good**  **Very Good**  **Good**  **Very Good**  **Very Good**  **Very Good**  **Very Good**  **Very Good**  **Very Good**  **Very Good**  **Good**  **Very Good**  **Very Good**  **Very Good**  **Very Good**  **Very Good**  **Very Good**  **Very Good**  **Very Good**  **Good** |
| **Make questionnaire and other research**  **Instrument** 3.4 **Very Good** | | |
| **Gather data needed in a specific research** 3.67 **Very Good** | | |

*Continuation of Table 13*

The table showcases the distribution of STEM students' literacy level in conducting research. The table shows that majority of the respondents chose definition of terms and summary, findings, conclusions, and recommendations, both garnered a mean of 3.79 and its qualitative description is very good according to the legend. The table implies that majority of the STEM students know how and what to write in definition of terms and summary, findings, conclusions, and recommendations. According to the study of Pedada (2023), definition of terms aims to ensure that readers have a common understanding of the terminology employed in the research, eliminating confusion and promoting clarity, the definitions provided serve as a reference point for readers, enabling them to comprehend the context and scope of the study, thus, improving the literacy level of students in conducting research. Williamz (2022) stated that students somehow find summary, findings, conclusions, and recommendations to be easily manageable because the long progress in their research enable them to fully grasp what is in their research, thus, given the time to process their research they will know how to and what to write in this part in their research.

**Chapter 5**

**SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

This chapter presents the summary of findings, conclusion and recommendations based on the data gathered.

**Summary**

This study determines the literacy level of Stem students, primarily those belong in Mt. Makiling of Iligan City National High School in Mahayahay, Iligan City, during the school year 2023-2024.

This study determines the literacy level of stem students, primarily those who belong to Mt. Makiling of Iligan City National High School in Mahayahay, Iligan City, during the school year 2023-2024.

This research study utilized the descriptive research method. Surveys, questionnaires, and tests are used to gather a series of pieces of information. The collected data is supported by the findings to tighten the proof of work.

The study sought to answer the following problems; (1) What are the student’s profile in terms of: (1.1) age; (1.2) gender; (1.3) religion; (1.4) relationship status; (1.5) junior high school curriculum; (1.6) working status; (1.7) father’s highest educational attainment; (1.8) mother’s highest educational attainment; (1.9) father’s occupation; (1.10) mother’s occupation; and (1.11) parent’s monthly income? (2) What are the factors that affect the literacy level of STEM students in conducting research? (3) What is the literacy level of STEM students in conducting research? (4) Is there a significant relationship between the literacy level and the factors that affect in conducting research? (5) What are the solutions or action plans can be drawn based on the results?

**Findings**

Based on the analysis and interpretation of the data gathered the following findings were drawn.

1. The profile of the respondents were:

1.1. 45 or 86.74 percent belong to the age range of 16-17 years old, followed by 6 or 11.54 percent at 18-19.

1.2. 27 or 51.92 percent are female while there are only 24 or 46.15 percent males, and 1 or 1.92 percent belong to the LGBTQ+.

1.3.. 29 or 55.77 of the respondents belong to the roman catholic religion, 6 or 11.54 percent are born again, 13 or 25 percent are Islam, 2 or 3.85 percent are SDA, 1 or 1.92 percent are INC, and 1 or 1.92 percent are pentecostal.

1.4. More than half of the respondents, 40 or 76.92 percent are single;

1.5. The majority of the STEM students took basic education during their junior high school curriculum with 32 or 61.54 percent, 11 or 21.15 percent are from STEP (Science, Technology and Engineering Program), 5 or 9.62 percent are from Journalism, 3 or 5.77 percent are from arts, and 1 or 1.92 percent are from sports.

1.6. Most of the respondents 48 or 92.31 percent don't work, while 4 or 7.69 percent are working;

1.7. Many of the respondents' fathers, 20 or 38.46 percent are college graduates, while 7 or 13.46 percent attained college level.

1.8. Many of the respondents' mothers, 17 or 32.64 percent are college graduates, while 14 or 26.92 percent attained college level.

1.9. The majority of the respondent's father's occupations are self-employed with 14 or 26.92 percent.

1.10. Majority of the respondents' mothers are housewives with 17 or 32.69 percent.

1.11. 14 or 26.92 percent of the respondents' parent's monthly income ranges from 10,001- 20,000, 11 or 21.15 percent earns 20,001-30,000, 10 or 19.23 percent earns 50,001- above, 6 or 11.54 percent earns 30,001-40,000 and 40,001- 50,000, and 5 or 9.62 percent earns below-10,000.

2. 52 of the respondents chose time management, and 42 respondents chose laziness as the highest factors that affect conducting research among STEM students

3. The majority of STEM student’s literacy level in conducting research belongs to the mean range of 3.0-3.9, which implies that they’re’ very good' based on the qualitative description.

4. Proposed as solutions or action plans to raise STEM students' research literacy levels are tutorials, lectures, courses, and financial aid.

**Conclusion**

Based on the data gathered, it states that the literacy level of STEM students in conducting research is magnificent. It shows that the lessons taught were effective and sufficient. Though there are factors that can hindrance the students to grasp information efficiently.

**Recommendation**

Based on the results and recommendations, more investigation is needed to better understand the obstacles STEM students encounter in time management and overcoming laziness when completing research. One may use interviews or group discussions to have a conversation. This will provide us deeper understanding of their tactics and experiences. It is important to evaluate the suggested remedies, such as financial aid and tutorials, to see how well they work to improve students' abilities. Additionally, this will make it easier to customize treatments to help STEM students succeed academically and develop their research abilities.

**Abstract**

In conducting research, this study sought to determine the literacy level of STEM (science, technology, engineering, and mathematics) students at Iligan City National High School, with a particular focus on Grade 11- Makiling during the academic year 2023–2024. The study sought to determine literacy levels, investigate possible relationships between literacy and influencing factors, identify factors impacting research conduct, and, based on findings, offer practical solutions. The method of descriptive research was applied. The data was gathered using a questionnaire created by the researcher. The study included frequency, percentage, and mean as statistical methods.

The results showed that the majority of respondents are unmarried, between the ages of 16 and 17, Roman Catholics, and have only received a basic education. The majority of students showed a "very good" literacy level in research, despite the fact that time management and laziness were found to be the main obstacles to conducting research.

As a result, the study suggested ways to help students overcome little obstacles, particularly those in the STEM stream, such as tutorials, lectures, modules, and financial support.

**PROPOSED ORIENTATION PROGRAM**

1. **Rationale**

The literacy level of STEM students in conducting research, plays a crucial role within the community, especially in academics. Although, minor factors may be encountered while enhancing one's ability in the fields of scientific research. Thus, modules offer a structured approach, breaking down complex concepts into manageable units for STEM students. They provide flexibility, allowing students to learn at their own pace and convenience. Tailored to address specific needs, modules promote engagement and accommodate diverse learning styles. By empowering students to take ownership of their learning journey, modules foster independence and critical thinking skills. They complement traditional instruction, reinforcing key concepts and maximizing learning outcomes. Additionally, modules allow for continuous improvement through periodic revision based on feedback, ensuring relevance and effectiveness in enhancing research literacy among STEM students.

1. **Objectives**

This module program is designed to provide enhancement with research literacy among STEM students. At the end of the program, the persons involved especially the stakeholders are expected to be able to:

1. Demonstrate improved comprehension of research methodologies and techniques relevant to their respective fields of study.

2. Apply critical thinking skills to evaluate and analyze scientific literature and research findings effectively.

3. Utilize various resources and tools to gather, analyze, and synthesize data for research purposes.

4. Demonstrate ethical awareness and responsibility in conducting research activities, adhering to professional standards and guidelines.

1. **Methodology**

School facilities shall implement a weekly distribution of modules in order to provide guidelines and utilize student’s comprehension of scientific research. School facilities must ensure that each student has their module assigned to their designated needs. Various topic guidelines will be employed for distributing modules.

1. **Operating Details and Time Frame**

Preferably the modules shall be done with a week. Project participants will be around 52 stakeholders comprising the immediate teachers in the Iligan City National High School parents, pupils. Representative to religious sectors group.

**Training Matrix**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TIME** | **MON** | **TUE** | **WED** | **THURS** | **FRI** |
| **8:00 – 9:20** | **Distribution of Modules** |  | **Answering Module 1** | **Answering Module 3** | **Post - Test** |
| **9:20 – 10:40** | **Pre - Test** |  |
| **10:40 – 10:50** |  | **Answering Module 2** | **Answering module 4** | **Distribution of Feedback Form** |
| **10:50 – 12:05** |  |  |

1. **Budget**

|  |  |
| --- | --- |
| **Goods and Services** | **Cost** |
| 1. **Supplies and Materials** | **60.00/pax** |
| 1. **Certificates** | **40.00/pax** |
| 1. **Tokens** | **200.00** |
| **TOTAL** | **300** |
| **Summary**  **Income**   * **Registration**   **(Php. 15.00/participantsx52)** | **Php. 780.00** |

1. **Evaluation**

An evaluation should be done in order to assess the overall impact of the module program with the literacy level of STEM students in conducting research. This is through the use of pre and post assessment surveys to capture the participants' knowledge and skill progression. Additionally, gathering feedback from participants on their experience and satisfaction also offers valuable insights.

**Reflection**

Our universe is vast and wide, and there's a lot of wonders circling it; some are explored and some remain unexplored. Everything is limitless. There are a lot of things that roam and are yet to be discovered. That is the reason we need research.

When I was young, curiosity about how things were discovered and studied really piqued my interest. I've read random articles, random papers, and random videos that really get me hooked up and want me to discover new things by myself. When I started high school, I luckily got accepted to this program where we focused on science and mathematics, and that is when I started to learn more about research. It gives me great experience and knowledge to be able to do research that is really successful, to the point that I was able to experience being part of a group placed in a research contest called LIKHA back then. As I step on my senior high school journey, research never fades out. I am still doing research with my new teacher. I know we've learned the same thing back when I was in junior high, but having a new perspective about making research is such a great opportunity for us to widen our knowledge about this miraculous field because there is a lot of information that is still unanswered and undiscovered. I may have had years of experience learning research back in those days, but I still have some hardship, especially making some of the parts like PAIS.

Research has a wide background and concepts; it may be hard if you think about it too much, but I guarantee that you will have the best experience that you've had once you started to adapt, making research and having the privilege to gain experience in this field.