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Self-Learning Modules as a Modality in the Teaching of Mathematics: Evidence from Southern Pinukpuk District, Philippines

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Abstract

This study investigated the pedagogical effectiveness of printed self-learning modules (SLMs) in Mathematics instruction during the COVID-19 pandemic, focusing on public secondary schools in Southern Pinukpuk District, Kalinga, Philippines. Specifically, it assessed the level of acceptability of printed Mathematics SLMs, determined the extent of their compliance with prescribed standards, and examined the extent of the problems encountered in answering the modules. Using a descriptive survey design, data were gathered from participants—including students, parents, teachers, and school heads—through structured questionnaires and interviews. Quantitative data were analyzed using weighted means and one-way ANOVA at a 0.05 level of significance, while qualitative responses were thematically coded. Results showed that printed Mathematics SLMs were moderately accepted by respondents, indicating their usefulness as instructional tools while pointing out areas for improvement. The modules were found to be highly compliant with established standards, particularly in technical requirements and content structure. However, serious challenges were noted in their utilization, such as unclear instructions, excessive activities, and limited parental support, which affected learners' ability to maximize the modules. The study recommends enhancing acceptability through feedback mechanisms, sustaining compliance via continuous monitoring and teacher training, and addressing problems by simplifying content, clarifying instructions, and fostering stronger collaboration among teachers, parents, and learners. By implementing these strategies, schools can improve the quality, accessibility, and effectiveness of Mathematics SLMs, thereby enriching students' learning experiences and ensuring their relevance and compliance with educational standards.

I. INTRODUCTION

The COVID-19 pandemic disrupted traditional classroom instruction, prompting the Department of Education (DepEd) to adopt modular distance learning (MDL) as a primary modality, especially in geographically isolated and low-connectivity areas like Southern Pinukpuk District, Kalinga. Printed self-learning modules (SLMs) became the cornerstone of mathematics instruction, yet their effectiveness remains uncertain. Learners faced cognitive, motivational, and logistical challenges in navigating these modules independently, while parents and teachers struggled to provide adequate support. Despite the modules being aligned with the Most Essential Learning Competencies (MELCs), questions persist regarding their clarity, usability, and responsiveness to learner diversity. This study addresses the gap between policy-driven modular implementation and the lived experiences of learners and stakeholders in rural public secondary schools.

1.1 Background of the Study

Mathematics is a foundational discipline that cultivates logical reasoning, problem-solving, and critical thinking—skills essential for lifelong learning and civic participation. Traditionally, instruction has relied on face-to-face classroom engagement, where teachers scaffold abstract concepts through guided practice and interactive discussion. The COVID-19 pandemic disrupted this model, prompting the Department of Education (DepEd) to implement modular distance learning (MDL) as the primary delivery modality, particularly in regions with limited internet connectivity and technological infrastructure.

In this context, printed self-learning modules (SLMs) became central to sustaining mathematics education across Philippine public schools. These modules were designed to align with the Most Essential Learning Competencies (MELCs) and provide independent learning opportunities during prolonged school closures. However, their effectiveness remains contested, especially in geographically isolated and disadvantaged areas such as Southern Pinukpuk District, Kalinga, where limited digital access and diverse learner profiles pose significant challenges.

Stakeholders—including students, parents, teachers, and school heads—have expressed concerns regarding the clarity, usability, and pedagogical soundness of the modules. Questions persist about their acceptability, compliance with curriculum standards, and the difficulties learners encounter when completing them. These realities underscore the need for a localized, evidence-based evaluation of printed mathematics SLMs to inform instructional improvements and policy refinement in modular learning environments.

1.2 Statement of the Problem

The abrupt shift to modular distance learning during the COVID-19 pandemic led to the widespread use of printed self-learning modules (SLMs) in mathematics instruction across Philippine public schools. While these modules were designed to align with DepEd's curriculum standards and ensure continuity of learning, their pedagogical effectiveness remains uncertain—particularly in geographically isolated and disadvantaged areas such as Southern Pinukpuk District, Kalinga.

Stakeholders have raised concerns about the clarity, usability, and instructional soundness of printed SLMs. Learners report difficulties in answering modules independently, while parents and teachers struggle to provide adequate support. Questions persist regarding the modules' acceptability, their compliance with curriculum standards, and the extent of problems encountered during implementation. Moreover, it is unclear whether these perceptions vary across stage levels, school affiliations, and stakeholder groups.

This study addresses the gap by empirically evaluating the printed mathematics SLMs used in Southern Pinukpuk District. It investigates stakeholder perceptions of acceptability, compliance, and learner challenges, and examines whether significant differences exist across moderator variables. The findings aim to inform the development of a responsive action plan to enhance the effectiveness of modular instruction in mathematics.

1.3 Objective of the Study

This study aims to evaluate the pedagogical effectiveness of printed self-learning modules (SLMs) in mathematics instruction within the secondary schools of Southern Pinukpuk District, Kalinga. Specifically, it seeks to:

1. Assess the level of acceptability of printed mathematics SLMs as perceived by students and parents.

2. Determine the extent of compliance of the developed mathematics SLMs with DepEd curriculum standards, as perceived by teachers and school heads.

3. Examine the extent of problems encountered by students and parents in answering printed mathematics SLMs.

4. Identify significant differences in stakeholder perceptions across moderator variables such as stage level, school affiliation, and stakeholder group.

5. Formulate a responsive action plan based on the findings to address identified issues and enhance the effectiveness of printed mathematics SLMs.

1.4 Significance of the Study

Findings from this research are expected to provide valuable insights for teachers, school heads, and curriculum developers in improving the design, content, and implementation of printed SLMs in Mathematics. Moreover, the results may serve as a basis for enhancing instructional materials in modular learning contexts, ensuring accessibility, relevance, and quality in basic education, particularly during times of disruption.

1.5 Scope and Delimitation

This study focuses on evaluating the pedagogical effectiveness of printed self-learning modules (SLMs) in mathematics instruction within public secondary schools in Southern Pinukpuk District, Kalinga, Philippines. It specifically examines three core dimensions: (1) the level of acceptability of the modules, (2) the extent of their compliance with DepEd curriculum standards, and (3) the severity of problems encountered in answering them.

The scope is limited to printed SLMs used during the COVID-19 pandemic under the modular distance learning (MDL) modality. Only mathematics modules distributed to Junior and Senior High School students during the school year covered by the study are included. The research does not evaluate digital modules, blended learning formats, or other subject areas.

The study is delimited to six public secondary schools in Southern Pinukpuk District and includes responses from four stakeholder groups: students, parents, teachers, and school heads. All groups participated in evaluating the acceptability, compliance, and challenges associated with the printed mathematics SLMs. The study does not include private schools, elementary levels, or perspectives from DepEd central office. Furthermore, it focuses on stakeholder perceptions and does not directly measure student learning outcomes or long-term academic performance.

These boundaries ensure that the findings are context-specific, inclusive, and grounded in the lived experiences of modular instruction in a geographically isolated and disadvantaged district.

1.6 Definition of Terms

To ensure clarity and consistency, the following key terms are defined as they are operationalized within the scope of this study:

Self-Learning Modules (SLMs): Printed instructional materials developed by the Department of Education for modular distance learning. In this study, SLMs refer specifically to mathematics modules used by Junior and Senior High School students in Southern Pinukpuk District during the COVID-19 pandemic.

Modular Distance Learning (MDL): A learning delivery modality implemented by DepEd wherein students learn independently using printed or digital modules, with minimal face-to-face interaction. This study focuses on the printed format of MDL.

Acceptability: The degree to which stakeholders (students, parents, teachers, and school heads) perceive the SLMs as appropriate, clear, and usable in terms of content, presentation, and assessment design. Measured using a Likert scale.

Compliance: The extent to which the printed mathematics SLMs adhere to DepEd curriculum standards, including alignment with Most Essential Learning Competencies (MELCs), instructional sequencing, and technical specifications. Evaluated by all stakeholder groups.

Problems Encountered: The challenges experienced by learners and parents in answering the SLMs, such as vague instructions, lack of feedback, misaligned tasks, and limited support. Assessed through stakeholder perception and frequency of occurrence.

Stakeholders: Individuals directly involved in or affected by the use of printed SLMs—namely students, parents, teachers, and school heads—who participated in the evaluation process.

Moderator Variables: Contextual factors used to analyze differences in stakeholder perceptions, including stage level (Junior vs. Senior High School), school affiliation, and stakeholder group.

II. REVIEW OF RELATED LITERATURE AND STUDIES

2.1 Previous Studies

The implementation of modular distance learning (MDL) during the COVID-19 pandemic prompted a surge of studies evaluating the effectiveness of self-learning modules (SLMs) across various disciplines. In the Philippine context, Dangle and Sumaoang (2020) found that while SLMs provided instructional continuity, learners struggled with comprehension and motivation, particularly in mathematics. Gueta and Janer (2021) emphasized the role of parental involvement, noting that limited capacity to assist learners contributed to poor engagement and performance. Similarly, Guillermo (2018) highlighted Filipino students' difficulty in transforming word problems into mathematical equations—a challenge exacerbated by the absence of teacher guidance in modular setups.

International studies echo these concerns. Aksan (2021) explored the cognitive demands of mathematics under remote learning conditions, revealing that students often lacked the scaffolding necessary to solve complex problems independently. Boaler (2016) and Dweck (2008) advocated for growth-oriented and collaborative learning environments, which are often missing in isolated, module-based instruction. Meyer (1978) and Susilo (2016) underscored the importance of instructional clarity, sequencing, and differentiated tasks in module development.

Despite these contributions, few studies have empirically assessed the extent to which printed mathematics SLMs comply with full curriculum standards or documented the severity of learner challenges in answering them. Moreover, limited research has examined stakeholder perceptions across multiple groups—students, parents, teachers, and school heads—within geographically isolated and disadvantaged districts. This study addresses these gaps by providing a localized, multi-stakeholder evaluation of printed mathematics SLMs in Southern Pinukpuk District, Kalinga.

2.2 Theoretical Framework

This study is anchored in Jerome Bruner's Constructivist Theory, which posits that learning is an active, meaning-making process wherein learners construct new ideas based on prior knowledge and experiences. Bruner emphasizes that learners do not passively absorb information; rather, they actively select, organize, and transform it to build cognitive structures—or schemas—that help them interpret and respond to learning tasks.

Fosnot (2005) expands on this view by advocating for learner-centered environments that promote inquiry, exploration, and autonomy. In such settings, students are empowered to formulate hypotheses, make decisions, and engage in problem-solving activities that deepen their understanding. Constructivism thus supports instructional designs that encourage independent learning, contextual relevance, and cognitive engagement.

In the context of modular distance learning, printed self-learning modules (SLMs) serve as vehicles for constructivist pedagogy. They allow learners to interact with mathematical concepts independently, apply prior knowledge, and navigate tasks without direct teacher facilitation. However, the effectiveness of these modules depends on their clarity, alignment

with curriculum standards, and responsiveness to learner diversity.

Bruner's theory informs the study's investigation of four key variables: (1) the acceptability of printed mathematics SLMs, (2) their compliance with DepEd curriculum standards, (3) the challenges learners encounter in answering them, and (4) the formulation of a responsive action plan. These dimensions reflect the extent to which SLMs support meaningful, autonomous learning in a constructivist framework—particularly within the geographically isolated and disadvantaged context of Southern Pinukpuk District.

2.3 Conceptual Framework

This study is guided by Bruner's Constructivist Theory, which emphasizes the learner's active role in constructing knowledge through experience, inquiry, and reflection. In the context of modular distance learning, printed self-learning modules (SLMs) serve as tools for independent exploration, allowing learners to engage with mathematical concepts without direct teacher facilitation. The effectiveness of these modules depends on their clarity, alignment with curriculum standards, and responsiveness to learner diversity.

The conceptual framework illustrates the relationship between the study's core variables:

Independent Variables

1. Acceptability of Printed Math SLMs – as perceived by students, parents, teachers, and school heads

2. Compliance with Curriculum Standards – based on stakeholder evaluation of content, structure, and alignment with MELCs

3. Problems Encountered in Answering SLMs – including instructional clarity, support mechanisms, and learner comprehension challenges

Moderator Variables

1. Stage Level – Junior High School vs. Senior High School

2. School Affiliation – six public secondary schools in Southern Pinukpuk District

3. Stakeholder Group – students, parents, teachers, and school heads

Dependent Variable

Effectiveness of Printed Math SLMs – inferred from stakeholder perceptions and triangulated across acceptability, compliance, and challenges

Output

Responsive Action Plan – formulated based on findings to improve instructional design, stakeholder support, and policy alignment.

III. METHODOLOGY

3.1 Research Design

This study employed a **descriptive survey research design** to evaluate the use of printed self-learning modules (SLMs) as a modality in teaching mathematics in the secondary schools of Southern Pinukpuk District, Kalinga. The design was chosen to systematically gather and analyze stakeholder perceptions—specifically those of students, parents, teachers, and school heads—regarding the acceptability, compliance, and challenges associated with the printed mathematics SLMs.

Descriptive survey design is appropriate for studies that aim to capture prevailing conditions, attitudes, and experiences without manipulating variables. It allows for the quantification of perceptions across diverse stakeholder groups and facilitates the identification of patterns and differences along moderator variables such as stage level, school affiliation, and stakeholder role.

The results of this design informed the formulation of a responsive action plan to enhance the implementation and instructional quality of printed mathematics SLMs in modular distance learning environments.

1) 3.2 Respondents / Participants

The respondents of this study were drawn from six public secondary schools in Southern Pinukpuk District, Kalinga, Philippines. A total of four stakeholder groups participated: **students**, **parents**, **teachers**, and **school heads**. These groups were selected based on their direct involvement in the use, evaluation, and implementation of printed mathematics self-learning modules (SLMs) under the modular distance learning (MDL) modality.

A **stratified purposive sampling technique** was employed to ensure representation across grade levels (Junior and Senior High School), school affiliations, and stakeholder roles. This approach allowed for balanced data collection and meaningful comparison across moderator variables.

- **Students** provided insights on the acceptability, clarity, and challenges of the printed mathematics SLMs based on their learning experiences.
- **Parents** shared perceptions regarding usability, support mechanisms, and learner difficulties encountered at home.
- **Teachers** evaluated the modules' compliance with DepEd curriculum standards, instructional design, and alignment with Most Essential Learning Competencies (MELCs).
- **School Heads** assessed the overall implementation, quality assurance, and institutional support for modular instruction.

Demographic data such as age, grade level, school affiliation, and stakeholder category were collected to analyze differences in perception across moderator variables. The inclusion of multiple stakeholder groups ensured a comprehensive and community-grounded evaluation of the printed mathematics SLMs.

3.3 Research Instruments

The primary data-gathering tool used in this study was a **structured questionnaire**, designed to evaluate stakeholder perceptions regarding the use of printed self-learning modules (SLMs) in mathematics instruction. The questionnaire was developed based on the study's independent variables: acceptability, compliance, and problems encountered, and was validated through expert review and pilot testing.

The instrument consisted of four main parts:

1. **Demographic Profile Section** – Captured respondent details such as stakeholder category (student, parent, teacher, school head), school affiliation, and stage level (Junior or Senior High School).
2. **Acceptability Scale** – Included Likert-type items measuring clarity, relevance, presentation, and perceived usefulness of the printed mathematics SLMs.
3. **Compliance Scale** – Assessed alignment with DepEd curriculum standards, including content validity, instructional sequencing, and adherence to Most Essential Learning Competencies (MELCs).
4. **Problems Encountered Scale** – Identified challenges in answering the modules, such as vague instructions, lack of support, and cognitive difficulty.

Each item was rated using a **five-point Likert scale** ranging from *Strongly Disagree (1)* to *Strongly Agree (5).* The instrument was administered in printed form to ensure accessibility in geographically isolated and disadvantaged areas. Responses were encoded and analyzed to determine patterns, differences across moderator variables, and implications for instructional improvement.

3.4 Data Collection Procedures

Data for this study were collected through the administration of structured questionnaires distributed to students, parents, teachers, and school heads across six public secondary schools in Southern Pinukpuk District, Kalinga. Prior to full deployment, the instrument underwent expert validation and pilot testing to ensure clarity, reliability, and contextual relevance.

The researcher coordinated with school heads and designated focal persons to facilitate the distribution and retrieval of printed questionnaires, ensuring compliance with health protocols and ethical standards. Respondents were briefed on the purpose of the study, assured of confidentiality, and given sufficient time to complete the instrument.

To accommodate the district's geographic and technological limitations, printed copies were used instead of digital forms. Completed questionnaires were collected manually, encoded, and organized according to stakeholder category, school affiliation, and stage level. The data were then subjected to statistical analysis to determine patterns,

differences, and implications for instructional improvement.

3.5 Data Analysis

Statistical Treatment of Data

The data collected through structured questionnaires were analyzed using both descriptive and inferential statistical techniques to address the study's objectives.

Descriptive statistics were employed to summarize stakeholder responses across the three core variables: acceptability, compliance, and problems encountered. The primary measure used was the weighted mean, which captured the overall level of agreement or perception across different groups. This was supported by frequency counts and percentage distributions to highlight response patterns and general trends.

Inferential statistics, specifically Analysis of Variance (ANOVA), were applied to determine whether significant differences existed in stakeholder responses when grouped by stage level, school affiliation, and stakeholder affiliation. A significance level of $p > 0.05$ was used to guide decision-making regarding the acceptance or rejection of the null hypothesis.

All statistical analyses were conducted using appropriate software tools, and results were interpreted in relation to the study's conceptual framework and research objectives. The findings informed the formulation of a responsive action plan aimed at improving the implementation of printed mathematics self-learning modules within modular distance learning environments.

IV. RESULTS AND DISCUSSION

This chapter presents the findings of the study based on the responses of students, parents, teachers, and school heads from six public secondary schools in Southern Pinukpuk District, Kalinga. The data are organized according to the three core variables: acceptability, compliance, and problems encountered in the use of printed mathematics self-learning modules (SLMs). Statistical analyses were conducted to determine differences across moderator variables: stage level, school affiliation, and stakeholder affiliation.

4.1 Acceptability of Printed Math Self-Learning Modules

The overall acceptability of printed mathematics SLMs was evaluated across four stakeholder groups.

Table 1. Level of Acceptability of Printed Math Self-learning Modules (n=1982)

Indicators	Average Mean	Descriptive Equivalent
A. Contents	2.23	Moderately Accepted (MoA)
B. Presentation	2.32	Moderately Accepted (MoA)
C. Assessment	2.37	Much Accepted (MA)
Total Average Weighted Mean (TAWM)	2.31	Moderately Accepted (MoA)

Table 1 shows that the printed math self-learning modules were generally rated as moderately acceptable, with assessment components receiving the highest approval among respondents.

Table 2. Level of Acceptability of Printed Math Self-learning Modules as to Stage Level

Stage Level	Mean	Descriptive Equivalent
JHS	2.30	Moderately Accepted (MoA)
SHS	2.32	Moderately Accepted (MoA)
Average Weighted Mean	2.31	Moderately Accepted (MoA)

Table 2 shows that both Junior and Senior High School respondents rated the printed math self-learning modules as moderately acceptable, with minimal variation between stage levels.

Table 3. Level of Acceptability of Printed Math Self-Learning Modules as to School Affiliation

School	**Mean**	**Descriptive Equivalent**
Allaguia NHS	2.32	Moderately Accepted (MoA)
Asibanglan NHS	2.28	Moderately Accepted (MoA)
Limos NHS	2.30	Moderately Accepted (MoA)
Mananig NHS	2.29	Moderately Accepted (MoA)
Pinukpuk Vocational School (PVS)	2.34	Much Accepted (MA)
Tappo VHS	2.33	Much Accepted (MA)
Average Weighted Mean	**2.31**	**Moderately Accepted (MoA)**

Table 3 shows that respondents from all six schools rated the printed math self-learning modules as moderately acceptable overall, with PVS and Tappo VHS showing slightly higher approval.

Table 4. Level of Acceptability of Printed Math Self-Learning Modules as to Stakeholder's Affiliation

Stakeholder's Affiliation	Mean	Descriptive Equivalent
Students	2.31	Moderately Accepted (MoA)
Parents	2.26	Moderately Accepted (MoA)
School Officials	2.36	Much Accepted (MA)
Average Weighted Mean	2.31	Moderately Accepted (MoA)

Table 4 shows that school officials rated the modules highest in acceptability, while parents gave the lowest ratings, though all groups remained within the moderately accepted range.

Table 5. Summary of ANOVA Results on Acceptability of Printed Math SLMs

Grouping Variable	**F-value**	**p-value**	**Interpretation**
Stage Level	3.95	0.05664	Not Significant ($p > 0.05$)
School Affiliation	1.75239	0.1316	Not Significant ($p > 0.05$)
Stakeholder Affiliation	2.0054	0.1473	Not Significant ($p > 0.05$)

*$p > 0.05$ Decision: Not Significant/Ho Accepted

Table 5 indicates that stage level, school affiliation, and stakeholder affiliation did not significantly affect the acceptability ratings of printed math SLMs, supporting the acceptance of the null hypothesis.

Table 6. Extent of Compliance of the Developed Mathematics Self-Learning Modules (n = 1982)

Component	**Mean**	**Interpretation**
A. Front Matter – COVER PAGE	2.88	Much Compliant (MC)
B. Body Inside Page	2.81	Much Compliant (MC)
C. Back Matter	2.52	Much Compliant (MC)
D. Technical Specifications	2.81	Much Compliant (MC)
Total Average Weighted Mean (TAWM)	**2.77**	**Much Compliant (MC)**

Table 6 shows that all components of the developed math self-learning modules were rated as **much compliant**, with the back matter receiving the lowest score but still within the highest compliance category.

Table 7. Extent of Compliance of the Developed Self-Learning Modules in Mathematics as to Stage Level

Stage Level	Mean	Descriptive Equivalent
Junior High School (JHS)	2.78	Much Compliant (MC)
Senior High School (SHS)	2.76	Much Compliant (MC)
Average Weighted Mean	**2.77**	**Much Compliant (MC)**

Table 7 shows that both Junior and Senior High School respondents rated the modules as much compliant, with JHS showing a slightly higher mean score.

Table 8. Extent of Compliance of the Developed Self-Learning Modules in Mathematics as to School Affiliation

School	Mean	Descriptive Equivalent
Allaguia NHS	2.774	Much Compliant (MC)
Asibanglan NHS	2.768	Much Compliant (MC)
Limos NHS	2.773	Much Compliant (MC)
Mananig NHS	2.765	Much Compliant (MC)
Pinukpuk Vocational School (PVS)	2.775	Much Compliant (MC)
Tappo VHS	2.769	Much Compliant (MC)
Average Weighted Mean	**2.77**	**Much Compliant (MC)**

Table 8 shows that all schools rated the modules as much compliant, with PVS receiving the highest mean score and Mananig NHS the lowest, though all remained within the top compliance category.

Table 9. Extent of Compliance of Developed Self-Learning Modules in Mathematics as to Stakeholder's Affiliation

Stakeholder's Affiliation	Mean	Descriptive Equivalent
Students	2.77	Much Compliant (MC)
Parents	2.74	Much Compliant (MC)
School Officials	2.80	Much Compliant (MC)
Average Weighted Mean	**2.77**	**Much Compliant (MC)**

Table 9 shows that all stakeholder groups rated the modules as much compliant, with school officials giving the highest rating and parents the lowest.

Table 10. Summary of ANOVA Results on Compliance of Developed Math Self-Learning Modules

Grouping Variable	F-value	p-value	Interpretation
Stage Level	0.580824	0.450248	Not Significant ($p > 0.05$)
School Affiliation	1.25188	0.289004	Not Significant ($p > 0.05$)
Stakeholder Affiliation	2.00793	0.142769	Not Significant ($p > 0.05$)

*$p > 0.05$ Decision: Not Significant/Ho Accepted

The ANOVA results indicate that stage level, school affiliation, and stakeholder affiliation did not significantly affect the perceived compliance of the developed math self-learning modules.

Table 10. Summary of Problems Encountered in Answering Printed Math Self-Learning Modules (n = 1982)

No.	Problem Encountered	Mean	Severity Level
1	Difficulty in grasping mathematical problems (e.g., word problems to equations)	2.82	Serious
2	Difficulty in independent learning	2.80	Serious
3	Lack of support from parents	2.80	Serious
4	Students' lack of interest	2.77	Serious
5	Incapacity of parents to assist learners	2.77	Serious
6	Vague directions	2.50	Serious
7	No intervention for struggling learners	2.37	Serious
8	Lack of communication between teacher and student	2.36	Serious
9	Lack of instructional materials	2.35	Serious
10	Psycho-social orientation not regularly conducted	2.33	Moderately Serious
11	No regular house visits conducted by teachers	2.16	Moderately Serious
12	Unstable mobile or internet connection	2.12	Moderately Serious
13	Conflict with other activities	2.08	Moderately Serious
14	No monitoring by school officials and DepEd personnel	2.07	Moderately Serious
15	Distance from house to school	1.99	Moderately Serious
	Average Weighted Mean	**2.42**	**Serious**

The overall mean of 2.42 indicates that respondents encountered a serious level of problems in using printed math SLMs, particularly in understanding mathematical problems, independent learning, and lack of parental support.

Table 11. Extent of Problems Encountered in Answering Printed Math Self-Learning Modules as to Stage Level

Stage Level	Mean	Descriptive Equivalent
Junior High School (JHS)	2.44	Serious
Senior High School (SHS)	2.40	Serious
Average Weighted Mean	**2.42**	**Serious**

Both JHS and SHS respondents encountered a serious level of problems in answering printed math SLMs, with JHS reporting slightly higher difficulty.

Table 12. Extent of Problems Encountered in Answering Printed Math Self-Learning Modules as to School Affiliation

School	Mean	Descriptive Equivalent
Allaguia NHS	2.43	Serious
Asibanglan NHS	2.46	Serious
Limos NHS	2.41	Serious
Mananig NHS	2.48	Serious
Pinukpuk Vocational School (PVS)	2.36	Serious
Tappo NHS	2.38	Serious
Average Weighted Mean	**2.42**	**Serious**

All schools reported a serious level of problems in answering printed math SLMs, with Mananig NHS showing the highest concern and PVS the lowest, though all remained within the same severity category.

Table 13. Extent of Problems Encountered in Answering Printed Math Self-Learning Modules as to Stakeholder's Affiliation

Stakeholder's Affiliation	Mean	Descriptive Equivalent
Students	2.41	Serious
Parents	2.45	Serious
School Officials	2.40	Serious
Average Weighted Mean	**2.42**	**Serious**

All stakeholder groups perceived the problems encountered in answering printed math SLMs as serious, with parents reporting the highest concern and school officials the lowest.

Table 14. Summary of ANOVA Results on Problems Encountered in Answering Printed Math Self-Learning Modules

Grouping Variable	F-value	p-value	Interpretation
Stage Level	3.953115	0.056641	Not Significant (p > 0.05)
School Affiliation	2.02236	0.083703	Not Significant (p > 0.05)
Stakeholder Affiliation	2.52795	0.091905	Not Significant (p > 0.05)

*p > 0.05 Decision: Not Significant/Ho Accepted

The ANOVA results show that stage level, school affiliation, and stakeholder affiliation did not significantly influence the extent of problems encountered in answering printed math SLMs. This supports the acceptance of the null hypothesis across all groupings.

4.3 Discussion of Findings

The results revealed that printed mathematics self-learning modules (SLMs) were moderately accepted across stakeholder groups, with school officials rating them highest in terms of content and presentation. Compliance with DepEd curriculum standards was affirmed by teachers and school heads, though inconsistencies were noted in cognitive scaffolding and assessment design. Learners and parents reported serious challenges in answering the modules, particularly due to vague instructions, misaligned tasks, and limited support mechanisms.

While curriculum compliance was assessed primarily by teachers and school heads due to their professional expertise in instructional standards and policy implementation, the perspectives of students and parents provided essential insights into the usability, clarity, and accessibility of the printed self-learning modules. These experiential accounts—though not technical evaluations—reflect the lived realities of modular instruction and reveal critical gaps in learner engagement, comprehension, and support systems. By integrating both expert and user perspectives, the study offers a holistic understanding of the challenges and opportunities in mathematics modular learning, particularly in geographically isolated and disadvantaged contexts. This inclusive approach reinforces the need for responsive instructional design that is not only policy-aligned but also learner-sensitive and community-validated.

These findings suggest that future module development must consider both technical compliance and the practical experiences of end-users to ensure equitable and effective mathematics instruction under modular distance learning.

V. CONCLUSION

Based on the findings, the following conclusions are drawn:

Moderate Acceptability – Printed mathematics SLMs are moderately accepted as a teaching modality. They provide flexibility and accessibility, which is advantageous for learners. However, improvements in clarity, engagement, and instructional design are needed to enhance overall effectiveness.

High Compliance – The modules comply with DepEd standards, including MELCs, layout, and technical specifications. This consistency across stage levels, school affiliations, and stakeholder

affiliations affirms their instructional validity and reliability for use in different educational contexts.

Serious Challenges / Limitations – Learners face significant challenges in completing the modules, particularly in transforming word problems, sustaining motivation, and receiving adequate support. These limitations highlight areas that need attention to ensure effective learning outcomes.

Applications / Implications – The findings underscore the importance of well-designed modules in supporting diverse learners. Enhancing the modules can improve learner engagement and performance, providing guidance for teachers, curriculum developers, and policymakers in using SLMs effectively across stage levels and schools.

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