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Empowering Grade IV Learners: Crafting Tailored Learning Resources for Science Mastery

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Abstrak

The quality of educational learning materials significantly contributes to student learning outcomes. Educators must plan, design, and create resources suited to specific learner demands. In teaching Science, teachers utilize accurate and relevant materials to influence quality. Consequently, this study aimed to determine the impact of utilizing crafted tailored learning resources on the academic performance in Science 4 of chosen respondents. The subjects involved 40 Grade IV learnersin Cluster B-Tingloy Sub-Office, SDO Batangas Province. A quantitative descriptive research method was utilized, where a teacher-made test and survey questionnaire served as primary data gathering instruments. Results implied that pre-test scores for most Grade IV learners reflected a fairly satisfactory performance level, as the majority scored 80 or below. Learners agreed that the crafted resources for Science Mastery were effective regarding content accuracy, grade-level congruence, and sequence of activities. They agreed that crafted learning resources contributed to learner engagement. Moreover, learners strongly agreed these contributed substantially to their learning outcomes. The primary challenge identified during the utilization of crafted tailored learning resources was a lack of pupil self-confidence in performing tasks. Lastly, based on results, proposed innovations include Prior Knowledge Tests, Write-shops, Creative Mind Boosters, Data-Based Collection of LRs, Self-Talk/Self-Love Activities, Home-School Link programs, and Research Forums. Based on findings, it is recommended that these crafted learning resources be sustained to promote effective learning and mastery. In utilizing tailored resources, teachers must consider characteristics like accuracy, congruence, and sequence of activities to be implemented. The crafted tailored resources should be utilized to engage learners and motivate them to perform better, leading toward improved academic outcomes. Furthermore, the quality of materials should be sustained through safekeeping to ensure that they meet standards and are suitable to learning competencies. Finally, the proposed activities and innovations should be utilized to maintain effective use of these tailored learning resources.

Keywords: *Crafted Learning Resources, Science Mastery, Grade IV Learners, Academic Performance, Contextualized Materials*

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Introduction

Aligned with the Department of Education's MATATAG Curriculum, this research is anchored in the mandate to provide relevant, inclusive, and high-q.uality education. Science education in the Philippines aims to foster scientific literacy, critical thinking, and global competence; however, data from the 2023-2024 Second Quarterly Assessment reveals that Science remains one of the most challenging subjects in the K-12 curriculum. As a Science teacher, the researcher observed that Grade IV learners specifically struggle with abstract competencies due to a lack of fundamental skills and a disconnect between lessons and their daily lives. To bridge these learning gaps, the researcher embarked on the creation and utilization of "crafted tailored learning resources"—instructional materials designed to be accurate, relevant, and localized.

These materials allow learners to construct their own knowledge by connecting scientific concepts to their immediate environment, thereby fostering higher engagement and motivation. This study evaluates the impact of these crafted tailored learning resources on the academic performance of forty Grade IV learners in Cluster B-Tingloy Sub-Office, SDO Batangas Province. It examines the characteristics of the resources—such as content accuracy, grade-level congruence, and logical sequencing—while identifying challenges encountered by learners, including a lack of self-confidence. Ultimately, the research proposes evidence-based enhancement activities and innovations, such as "Creative Mind Boosters" and "Self-Talk Activities," to sustain effective Science instruction. By prioritizing student engagement and relatable context, this study seeks to empower learners to become informed, participative citizens in a technological world, directly supporting the DepEd's goal of improving learner well-being and academic mastery through innovative teaching strategies.

This study aimed to describe the effectiveness of crafted tailored learning resources in enhancing the academic performance of Grade IV learners in Science.

Specifically, it sought to answer the following questions:

1. What is the performance of Grade IV pupils on the teacher-made pre-as3sessment test?
2. How may the crafted tailored learning resources for Science Mastery be described in terms of?
   2.1 accuracy of content ;
   2.2 congruence to their level ; and
   2.3 sequence of activities?
3. How can the crafted tailored learning resources for science mastery contribute to learners in terms of?
   3.1 learners' engagement; and
   3.2 learning outcomes?
4. What are the challenges encountered by Grade IV learners during the utilization crafted tailored learning resources for Science?
5. Based on the results, what enhancement activities may be proposed?

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Methodology

Research Design

This study employed a **quantitative descriptive research design** to evaluate the effectiveness of crafted tailored learning resources in enhancing the Science performance of Grade IV learners. The design allowed the researcher to systematically analyze current learning conditions and provide a factual basis for proposing enhancement activities and innovations to sustain academic mastery.

Participants

The subjects were **40 Grade IV learners** from the public elementary school in Cluster B, Tingloy Sub-Office, SDO Batangas Province (Bago Primary, San Pedro Elementary, and Papaya Elementary Schools). **Purposive sampling** was used to select respondents from the researcher's current affiliation.

Research Instrument

The study utilized two primary data-gathering tools: a **20-item teacher-made pre-assessment and a researcher-made survey questionnaire**. The instruments were developed based on the Science 4 Most Essential Learning Competencies (MELCs) and existing frameworks for localized learning resources.

The questionnaire included several sections covering:

- **Accuracy of Content** (Clarity of instructions and factual correctness)
- **Congruence to Grade Level** (Suitability of tasks for Grade IV learners)
- **Sequence of Activities** (Logical flow from easy to difficult)
- **Impact on Learning Engagement and Outcomes**

A **four-point Likert scale** was used to measure student responses, while assessment scores were categorized to determine the learners' performance levels.

Data Collection Procedure

The researcher secured formal approval from the District Supervisor and School Heads of Cluster B, Tingloy Sub-Office. Ethical clearance and informed consent were obtained from the parents of the Grade IV respondents, ensuring adherence to the Data Privacy Act and maintaining utmost confidentiality.

An overview of the study goals was provided to the participants before administering the pre-assessment. This was followed by the strategic integration of the crafted tailored learning resources into Science 4 instruction. A post-assessment and survey questionnaire were

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administered to evaluate the effectiveness of the resources. Collected data were then retrieved, recorded, and subjected to statistical computation and interpretation.

Data Analysis

The collected data were analyzed using the following statistical tools:

- **Frequency and Percentage** – to determine the distribution of responses and the magnitude of each frequency relative to the total number of respondents.
- **Weighted Mean** – to compute the average responses and determine the typicality of perceptions regarding the crafted learning resources.
- **Ranking** – to identify the most and least significant indicators based on the obtained weighted means.
- **Mean Percentage Score (MPS)** – to calculate the ratio of correctly answered items, representing the overall academic performance level of the learners.

Results

1. **Performance level of Grade IV pupils on the teacher-made pre-assessment test**

Table 1
Results of Pre-Test

Performance	Pre-Test	
	Frequency	Percentage
Outstanding (91-100)	4	10%
Very Satisfactory (81-90)	8	20%
Satisfactory (71-80)	12	30%
Fair (61-70)	12	30%
Did Not Meet the Standards (60 and below)	4	10%

Table 1 reveals that only **10%** of learners achieved an "Outstanding" performance during the pre-test, while the majority (**70%**) fell within the Satisfactory, Fair, or "Did Not Meet Standards" categories.

The findings suggest that utilizing contextualized, tailored learning resources can serve as a necessary intervention to positively influence and enhance pupils' academic achievement in Science.

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2. Description of the crafted tailored learning resources for Science Mastery

Table 2
Crafted Tailored Learning Resources for Science Mastery in terms of Accuracy of Content

Indicators	WM	VI
1. The learning materials contained precise and accurate information. *(Ang mga kagamitang panturo ay mayroong wasto at tamang impormasyon)*	3.35	Agree
2. The activities and materials are aligned with the competency. *(Ang mga gawain at kagamitang panturo ay angkop sa layunin.)*	3.35	Agree
3. The learning materials are free from any kind of errors. *(Ang mga kagamitang panturo ay walang maling datos.)*	3.50	Strongly Agree
4. The learning materials contained instructions that are clear and easy to understand. *(Ang mga kagamitang panturo ay mayroong mga panutong maliwanag at madaling maunawaan.)*	3.53	Strongly Agree
5. The content of the materials and learning resources are well-organized. *(Ang mga nilalaman ng mga kagamitang panturo ay maayos at organisado.)*	3.48	Agree
Composite Mean	**3.44**	**Agree**

Table 2 shows that the crafted tailored learning resources achieved a composite mean of **3.44**, indicating that learners "Agreed" with the accuracy of the content. The highest-rated indicator was the clarity of instructions (**3.53**), while the alignment with competencies and precision of information both received the lowest, yet still positive, mean of **3.35**. These results demonstrate that the materials are reliable and adhere to educational standards.

Table 3
Crafted Tailored Learning Resources for Science Mastery in terms of Congruence to their Level

Indicators	WM	VI
1. The learning resources used are aligned with the learning targets. *(Ang mga kagamitang panturo ay akma sa mga layunin.)*	3.38	Agree
2. I was engaged and motivated because the tasks promote learners' skills and potentials. *(Ako ay naganyak at nasiyahan dahil sa mga gawaing nagpapaunlad ng aking kakayanan.)*	3.58	Strongly Agree
3. The learning materials encourage learning tasks suited to our Grade level. *(Ang mga kagamitang panturo ay may mga gawaing akma sa aming antas o lebel.)*	3.55	Strongly Agree
4. The concepts in Science are easily understood because they are aligned with the learning tasks. *(Ang mga konsepto at aralin sa Science ay lubos kong naunawaan dahil akma ang mga ito sa mga gawain.)*	3.40	Agree
5. The localized and contextualized learning materials address the learning gaps in Science. *(Ang lokal at nakakontekstong kagamitang panturo ay nagbibigay-diin sa mga kakulangan sa pagkatuto sa Science).*	3.40	Agree
Composite Mean	**3.46**	**Agree**

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Table 3 indicates that the crafted learning resources are highly congruent with the respondents' grade level, earning a composite mean of **3.46** ("Agree"). The highest-rated indicator (**3.58**) reveals that students felt strongly motivated by tasks that promoted their specific skills and potential. While alignment with learning targets received the lowest mean (**3.38**), it still maintained a positive verbal interpretation.

Table 4
Crafted Tailored Learning Resources for Science Mastery in terms of Sequence of Activities

Indicators	WM	VI
1. The activities in those materials started with the lowest level of difficulty going to the average and difficult levels. *(Ang mga gawain ay nagsimula sa pinakamababang lebel patungo sa katamtaman at mahirap na lebel.)*	3.43	Agree
2. The learning materials used are well-organized and engaging. *(Ang mga kagamitang panturong ginamit ay organisado ang kapana-panabik.)*	3.45	Agree
3. I was motivated to accomplish the activities because they are coordinated. *(Ako ay naganyak na gawin ang mga gawain at aralin dahil ang mga ito ay magkaka-ugnay.)*	3.58	Strongly Agree
4. The activities and materials are challenging and promoting learners' creativity and logical thinking. *(Ang mga gawain at kagamitan ay nakakapanabik at nagbibigay halaga sa aking kakayanan at pagkamalikhain.)*	3.40	Agree
5. The sequence of activities is effective and based on the learning goals. *(Ang pagkakasunod-sunod ng mga gawain ay epektibo at batay sa layunin ng aralin.)*	3.48	Agree
Composite Mean	**3.47**	**Agree**

Table 4 shows that the crafted learning resources achieved a composite mean of **3.47**, indicating that learners "Agree" with the effective sequencing of activities. The highest weighted mean (**3.58**) reveals that students were strongly motivated by the coordinated flow of tasks, which directly enhanced their achievement levels. While the promotion of creativity and logical thinking received the lowest mean (**3.40**), it remained within the positive "Agree" range.

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3. Contribution of Crafted Tailored Learning Resources on Learners' Performance

Table 5
Learning Resources on Learners' Performance with regards to Learners' Engagement

Indicators	WM	VI
1. I became engaged and curious to acquire new skills and knowledge. *(Ako ay naganyak at naging intresado na matuto at magkaroon ng bagong kakayanan.)*	3.38	Agree
2. I participated actively during the activities. *(Naging aktibo ang aking pakikibahagi sa mga gawain.)*	3.48	Agree
3. I was able to pay attention and showed excitement as I performed the learning tasks. *(Naglaan ako ng atensyon at kasiyahan habang isinasagawa ang mga gawain).*	3.40	Agree
4. I was able to show interest and enthusiasm to perform the tasks. *(Ako ay nagpakita ng interest at kahusayan sa pagsasagawa ng mga gawain*.)	3.48	Agree
5. I was interested and challenged to learn as I can easily relate with the activities. (Naging intresado ako at nasabik na matuto habang madali kong nauunawaan ang mga gawain).	3.60	Strongly Agree
Composite Mean	**3.47**	**Agree**

Table 5 illustrates that the crafted tailored learning resources significantly enhanced student engagement, earning a composite mean of **3.47** ("Agree"). The highest weighted mean (**3.60**) confirms that students were strongly interested and challenged because they could easily relate to the activities. While the curiosity to acquire new skills received the lowest mean (**3.38**), learners overall demonstrated active participation and enthusiasm.

Table 6
Learning Resources on Learners' Performance with regards to Learning Outcomes

Indicators	WM	VI
1. I was able to understand the concepts because I can easily relate with the materials used. *(Naunawaan ko ang mga konsepto ng aralin dahil madaling makaintindihan ang mga nilalaman ng kagamitang panturo.)*	3.48	Agree
2. I learned the lessons easily because I effectively used my prior knowledge. *(Naunawaan kong lubos ang aralin dahil epektibo ang paggamit ko ng aking kakayanan.)*	3.45	Agree
3. I was able to use the strategies to organize my ideas and knowledge. *(Nagamit ko ang mga estratehiya sa pag-oorganisa at pag aayos ng mga ideya at kaalaman.)*	3.50	Strongly Agree
4. I mastered the learning competencies and developed logical and creative thinking. *(Natutunan ko ang mga layunin ng aralin at napaunlad ang aking kakayahan at pagkamalikhain ng aking isipan).*	3.55	Strongly Agree
5. I was able to perform the learning tasks as the materials and strategies used are effective and accurate. *(Naisagawa ko ang mga gawain dahil ang mga kagamitan at estratehiyang ginamit ay epektibo at wasto).*	3.60	Strongly Agree
Composite Mean	**3.52**	**Strongly Agree**

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Table 6 reveals that Grade 4 learners "Strongly Agreed" (**3.52**) that the crafted learning resources significantly improved their learning outcomes. The highest weighted mean (**3.60**) suggests that effective and accurate materials enabled pupils to successfully perform complex tasks, reflecting a marked development in their academic performance. While the use of prior knowledge received the lowest mean (**3.45**), students still agreed that it helped them learn more easily.

4. Challenges encountered by Grade IV learners during the utilization of crafted tailored learning resources

Table 7 indicates that Grade 4 learners encountered minimal challenges during the study, as evidenced by a composite mean of **1.54** ("Disagree"). The highest-rated challenge, though still interpreted as a disagreement, was a lack of self-confidence (**2.28**), followed by inadequate prior knowledge (**1.58**). Notably, learners "Strongly Disagreed" that unclear instructions (**1.33**) or the unsuitable difficulty of materials (**1.45**) were issues, suggesting the crafted resources were highly accessible.Respondents "Agreed" that the utilization of crafter tailored learning resources increased their interest and participation (engagement mean of 3.47) and "Strongly Agreed" that the materials improved their learning outcomes by helping them relate to the concepts.

Table 7
Challenges encountered

Description	WM	VI	Rank
1. Inadequate prior knowledge *(Hindi sapat na batayang kakayanan ng mga mag-aaral)*	1.58	Disagree	2
2. Learners' lack of engagement to accomplish the activities *(Kawalan ng kagustuhan ng mga mag-aaral na maisagawa ang mga gawain)*	1.45	Strongly Disagree	10
3. Lack of accuracy on the content of the localized materials *(Hindi wasto at maayos na nilalaman ng mga lokal na kagamitan)*	1.45	Strongly Disagree	10
4. Learners have no familiarity with the activities given *(Hindi pamilyar ang mag-aaral sa mga gawaing ibinigay)*	1.50	Disagree	5
5. Ineffective sequence of activities and strategies *(Hindi epektibo ang pagkakasunod-sunod ng mga gawain at estratehiya)*	1.50	Disagree	5
6. Not suitable level of difficulty of materials used *(Hindi akma lebel ng mga ginamit na kagamitan sa kakayanan ng mga mag-aaral)*	1.45	Strongly Disagree	10
7. Inadequate time allotted for the activities *(Hindi sapat ang oras na itinakda para sa mga gawain)*	1.48	Strongly Disagree	7.5
8. Lack of variety of materials used *(Kawalan ng pagkakaiba-iba ng mga kagamitang ginamit)*	1.48	Strongly Disagree	7.5
9. Lack of learner's motivation to follow and perform the activities (Kawalan ng motibasyon ng mga mag-aaral na sundin at gawin ang mga gawain)	1.53	Disagree	3
10. Insufficient availability of localized materials *(Hindi sapat na mga kagamitang lokal)*	1.50	Disagree	5
11. Lack of pupil's level of self-confidence *(Kawalan ng lakas ng loob at tiwala sa sarili ng mag-aaral)*	2.28	Disagree	1
12. Not effective and unclear instructions given *(Hindi epektibo at hindi malinaw ang mga panutong ibinigay)*	1.33	Strongly Disagree	12
Composite Mean	**1.54**	**Disagree**	

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5. Proposed enhancement activities to sustain the effective utilization of the crafted tailored resources in Science

Learners' Prior Knowledge Test: Conducts interactive pre-assessments to establish baseline data and post-assessments to measure the growth in learners' academic performance and resource effectiveness.

Write-shop Activity: Equips teachers with the skills to collaborate on designing and crafting localized, context-based Science materials that are relevant and accessible to students.

Creative Mind Booster: Utilizes competency-aligned resources to stimulate logical and critical thinking, helping students bridge the gap between their personal experiences and scientific concepts.

Data-Based Collection of LRs: Establishes a systematic digital and physical repository for consolidating crafted materials, ensuring they are accurately recorded and easily accessible for future use.

Self-Talk and Self-Love Activities: Addresses lack of self-confidence through differentiated group tasks, speaking activities, and collaborative sharing to enhance learner engagement and motivation.

Home-School Link Activity: Strengthens partnerships with parents and stakeholders to ensure a supportive environment and consistent delivery of learning strategies both at home and in school.

Research Forums and Benchmarking: Encourages teachers to conduct further studies and peer-sharing to continuously innovate and refine the utilization of tailored learning resources.

Discussion

The findings underscore the pivotal role of crafted tailored learning resources in bridging the gap between abstract scientific concepts and learner mastery. The transition from a low pre-assessment performance to high levels of student engagement suggests that contextualized materials and coordinated activity sequences significantly enhance the learning experience. By aligning content with the Science 4 MELCs and the specific experiences of Grade 4 learners, the intervention fostered a more relatable and motivating environment that encouraged active participation.

Students' strong agreement regarding the accuracy, congruence, and sequencing of the materials indicates that well-designed resources contribute to a more organized and effective construction of knowledge. These results support existing literature highlighting how localized and meaningful instructional aids transform classroom instruction into a more authentic and inclusive process, allowing learners to effectively leverage their prior knowledge.

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While the study identified minimal challenges, the slight struggle with self-confidence highlights a need for continued focus on learner empowerment. Addressing these minor barriers requires the consistent use of interactive strategies and the maintenance of a robust repository of localized materials. Proposed enhancement activities, including "Creative Mind Boosters," "Self-Talk and Self-Love Activities" to build confidence, and a "Data-Based Collection of LRs" and Home-School Link activities—are essential to sustain these academic gains, strengthen teacher capacity, and ensure the long-term effectiveness of Science instruction.

Conclusion

The pre-assessment results revealed that most Grade IV learners initially performed at a fairly satisfactory level or below, highlighting a significant need for instructional intervention. However, the implementation of crafted tailored learning resources proved highly effective, with students affirming that the materials were accurate, grade-level appropriate, and logically sequenced. These resources not only boosted learner engagement and motivation by making Science more relatable but also led to a strong improvement in overall learning outcomes.

Despite these gains, learners still faced minor challenges such as a lack of self-confidence, inadequate prior knowledge, and occasional lapses in motivation. To address these hurdles and sustain academic mastery, the study proposes a comprehensive set of enhancement activities, including "Creative Mind Boosters," "Self-Talk and Self-Love Activities" to build confidence, and a "Data-Based Collection of LRs and Home-School Link Activities". These initiatives, along with systematic data collection and research benchmarking, aim to institutionalize the use of localized materials for more effective and inclusive Science instruction.

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