WORKSHEET: REMEDIAL MATERIALS IN TEACHING MATHEMATICS 10

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Abstract

This study aimed to determine the effectivity of the worksheet as remedial materials in teaching Mathematics 10 in terms of components, the level of students' mathematics performance in terms of pretests and posttest, and significant difference in the use of worksheet and students' performance in terms of pretest and posttest.

The study employed the descriptive method type of research design. The developed worksheet in Mathematics 10 was evaluated by thirty (30) respondents from twenty-six (26) Grade 10 Mathematics teachers and four (4) master teachers from the public secondary schools in Cluster 3 Division of Laguna covering Pagsanjan, Pila and Santa Cruz specifically. The researcher made a learning activity sheet, which was presented to the thesis adviser for the suggestions, revision, guidelines, and proper construction of instructional materials to test its effectiveness to the performance in mathematics of selected respondents.

As a results, the worksheet was given by a remark of extremely valid in all its component's characteristics such as the objectives, content, examples, assessment, design, clarity, appropriateness, and usefulness. The students showed developing level of performance in their pretest. In the posttest, they showed proficiency level of performance as shown by the computed mean. The result also revealed that there was a significant difference on the use of worksheet and students' performance in Mathematics based on their pretest and posttest.

The null hypothesis indicating that there was no significant difference on the use of worksheet and students' performance based on their pretest and posttest was hereby rejected. Rejection of the null hypothesis shows that the worksheet was effective as a remedial material in teaching Mathematics 10 specifically on topics involving permutations, combinations, and probability.

The school administrators may encourage teachers to create learning material as a supplementary material that support the needs of learners to have the mastery of the topic. Teachers should adapt the use of worksheet as a remedial material in teaching Mathematics and as part of teaching methodology of the teacher to increase learners' academic performance. Teachers were encouraged to develop worksheet as a remedial material teaching not only in Mathematics but also in other areas of learning. This implies that the crafted worksheet was effective as a remedial material in teaching Mathematics specifically on topics involving permutations, combinations, and probability.

Keywords: Worksheet; Remedial Materials; *Students' Performance*;

1. Main text

Introduction

Mathematics plays an important role in our lives. It became into the public eye in a few weeks as the

COVID-19 pandemic spread in the whole world with devastating consequences. The economy slowed down, different nations panicked, and education in the Philippines was delayed. The government and the Department of Education did not stop even when schools were closed. The curriculum was enhanced together with the updated strategies, improvement of the learning and teaching materials and assessments to fit in the New Normal situation.

As DepEd Sec. Leonor M. Briones always reiterated and assured that "no Filipino learners must not be left behind" (Alcober, 2020), the Department of Education (DepEd) worked collaboratively with the other agencies to uplift the morale of teachers, parents, and students. This policy was stipulated in the Constitutional Right of all Citizens to Quality Education authored by Senator Manny Villar in 2010. Senate Bill No. 75, an act ensuring the full realization of the Constitutional Right of All Citizens to Quality Education ordaining for the purpose "A No Filipino Child Left Behind Act of 2010". In section 2, it was declared a policy of the State to protect and promote the right of the citizen to quality education and to take appropriate steps to make such education accessible to all. Thus, Section 1, Article XIV of our Constitution imposes upon the State the responsibility to "protect and promote the right of all citizens to quality education at all levels" and "take appropriate steps to make such education accessible to all". The development and evaluation of teacher-made worksheets serve as an intervention or remedial material in teaching Mathematics for those learners who did not meet the mastery level (Sambayon, 2020). It also helps the learners to unlock their difficulties in a certain topic.

Different programs and projects were crafted for children of school ages be kept in school. The delivery modes for the learners were deeply thought about for the lessons be extended and objectives of the lessons be achieved. As defined in DepEd Order 12, series of 2020, blended delivery modes, be online or modular learning modalities, helped in the teaching-learning process of the students at home. Teachers were busy working together with parents as the key workers to support the learners by providing online or modular teaching from home. Mathematics teachers played a great role in rebuilding the confidence of their learners and helped them achieved their ambitions. Some qualities were nurtured by Mathematics teachers like qualitative reasoning, critical thinking and problem-solving skills, spatial ability, and the like.

Instructional and learning materials were modified just to make the lessons easier following the MELC prescribed by the Department of Education. These teacher-made learning materials motivated learners and maintained interests in the field of Mathematics. Teaching-learning experiences by both teachers and students resulted to a personalized instructional material one of which was the teacher-made worksheet.

Best (2020) enumerated 12 teaching strategies for every teacher like station rotation, group work, formative assessments, graphic organizer, response to intervention, modelling, high order questions, scaffolding, Inquiry-based learning, direct instruction, project-based learning, and gamification. Response to intervention (RTI) can be used to students needing extra support, altering the strategy of the teacher to re-engage students who were falling behind.

Based on previous studies, the use of remedial materials reassures self-determining study (Cantonjos & Janer, 2022). One of the aids of using remedial materials for instruction was the attainment of better self-study or learning skills among students. In this study, students were expected to participate themselves in learning the ideas presented in the materials. They grow a sense of obligation in completing the tasks and with little or no support from others, the learners improve on their own. Hence, the purpose of this research was to develop worksheets as remediation materials in teaching G10 mathematics included in the third quarter of the PIVOT 4A Budget of Work (BOW) in Mathematics.

Theoretical Framework

The Self-Determination Theory, which Deci and Ryan proposed in 1985, served as the foundation for this study. Self-determination theory has been used in a wide range of contexts, including work, parenting, exercise, and health (Cherry, 2021). According to Chiu (2022), high levels of self-determination can promote

success in a variety of spheres of life. In theory, a student can exercise self-determination even if they were required to follow externally imposed standards for proper classroom conduct, for instance. Therefore, the teachers' primary motivation for inspiring students was to assist students in meeting their basic needs and to prevent school policies or their own leadership styles from obstructing or interfering with students' ability to do so.

The researcher believes that this theory was crucial because, for a variety of reasons, it was unrealistic to expect teachers in most classrooms to always meet all the students' basic needs. The outcome from the perspectives of the students was typically a simultaneous mixture of internal and extrinsic incentives and only a partial feeling of self-determination. The "intrinsic-ness" of motivation, according to self-determination theory, was a matter of degree, ranging from extremely extrinsic to various combinations of intrinsic and extrinsic, to highly intrinsic (Lopez-Garrido, 2021). Therefore, the task was to design and foster motives that were as intrinsic as feasible rather than expecting pupils to always be motivated solely by intrinsic factors. To do this, the teacher must assist students in meeting their fundamental requirements for autonomy, competence, and relatedness.

The researcher attempted to determine the level of students' performance in mathematics with the use of developed worksheet as a remedial material in teaching Mathematics 10 in terms of its components. The developed worksheet helps the students to overcome their difficulties encountered for a certain topic. It will help the researcher to assess students' mastery level of understanding towards the topics in Mathematics 10.

Statement of the Problem

This study aims to determine the effectivity of the teacher-made worksheet in Grade 10 Mathematics for the 3rd quarter.

Specifically, it sought to answer the following questions:

1. What is the level of validity of the worksheet in Mathematics10 in terms of components with regards to:
    1.1 Objectives;
    1.2 Content;
    1.3 Examples;
    1.4 Assessment;
    1.5 Design;
    1.6 Clarity;
    1.7 Appropriateness; and
    1.8 Usefulness?
2. What is the level in Students' Mathematics Performance in terms of:
    2.1 Pretest?
    2.2 Posttest?
3. Is there a significant difference in the use of worksheets and students' performance in Mathematics in terms of pretest and post-test?

Research Methodology

This study used the descriptive method as which describes a population, situation, or phenomenon that is being studied. It focuses on answering the how, what, when, and where questions. If a research problem, rather than the why. This method was used to describe the components and characteristics of what was being studied. Descriptive research aims to have deeper knowledge about the topic or situation. It is designed to describe the distribution of one or more variables, without regard to any causal or other hypothesis (Aggarwal and

Ranganathan, 2019). Hence, this type of research design was an applicable way to determine if the developed worksheet, a remedial material in teaching Mathematics 10 was evaluated.

With the conduct of the study, the development and evaluation of the Worksheet as Remedial Materials in Teaching Mathematics 10, the specific number of Grade 10 Mathematics teachers and master teachers was used. The evaluators of the worksheet were composed of thirty (30) respondents, twenty-six (26) Grade 10 Mathematics teachers and four (4) master teachers from the public secondary schools in Cluster 3 Division of Laguna covering Pagsanjan, Pila, and Santa Cruz specifically. The developed worksheet was conducted among Two Hundred (200) selected Grade 10 students at Pedro Guevara Memorial National High School from Grade 10- Dalandan, Grade 10- Dao, Grade 10- Dayap, Grade 10 – Duhat and Grade 10 – Gmelina under Modular Distance Learning Modality School Year 2021-2022.

Judgmental or purposive sampling design is based on the judgment of the researcher as to who will provide the best information to succeed for the objectives study. The person conducting the research need to focus on those people with the same opinion to have the required information and be willing of sharing it (Etikan and Bala, 2017).

After securing a permit from the Office of the Schools Division Superintendent to conduct the study, the proponent underwent the following stages, and then monitored its development until the completion of the study.
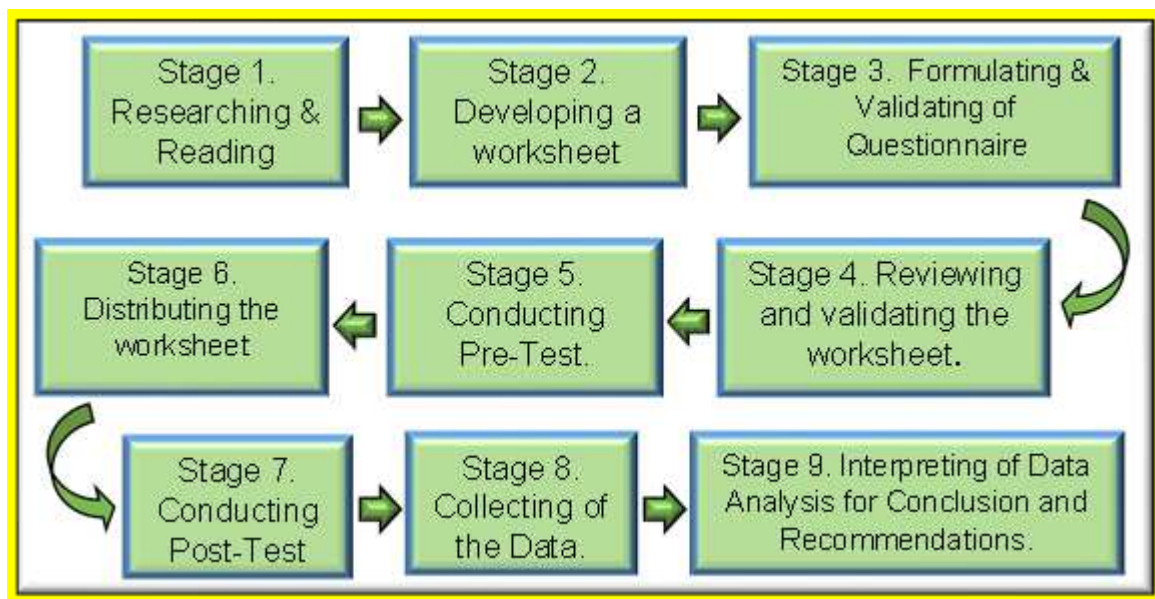

Figure 2. The Research Procedure of the Study

    Stage 1. Researching and Reading. The researcher started to read the published and unpublished materials for the related literature and studies.

    Stage 2. Developing a Worksheet. Taking into consideration the ideas and activities about the topics in Mathematics 10, the researcher decided to pattern the lessons to the Most Learning Competencies by DepEd. The worksheet was composed of objectives, content, examples, and assessment. The lessons were intended for 8 weeks that covered Third Quarter.

    Stage 3. Formulating and Validating Questionnaire. To validate the research made questionnaire, four people who have expertise in the related study and were not the actual respondents of the study were given copies. Suggestions and comments from them were considered in making the final revisions and editing of the

questionnaire intended for the samples

       Stage 4. Reviewing and Validating the Worksheet. The developed worksheet in Mathematics 10 was evaluated by thirty respondents composed of twenty-six Grade 10 Mathematics Teachers and four Mathematics Master Teachers with the permission of the school heads.

       Stage 5. Conducting Pre-Test. A 30-item test was given to the respondents to be used as data to the study to determine the student's prior knowledge in specific topics in Mathematics 10.

       Stage 6. Distributing the Worksheet. The developed worksheet was used by Two Hundred selected Grade 10 students covering the Third Quarter topics in Mathematics 10.

       Stage 7. Conducting Post-Test. At the end of the Third Quarter, parallel test was given to the respondents to determine the mastery level of understanding of the students.

       Stage 8. Collecting of the Data. The researcher collected the checklist used for evaluation of the worksheet in public secondary schools in Cluster 3, Division of Laguna composed of Pagsanjan, Pila, and Santa Cruz Districts. The results of pretest and posttest were also collected. These data were used to determine the validity of the worksheet in terms of its components and to determine the significant difference in the use of worksheet and students' performance in Mathematics based on their pretest and posttest.

Stage 9. Interpretating of Data Analysis for Conclusion and Recommendations. The researcher tallied, tabulated, analyzed and interpreted all the responses of the respondents. Based on the findings, the conclusion and recommendations were drawn.

       The research instrument used in the study was the checklist for the validation and acceptability of the Worksheet: Remedial Materials in Teaching Mathematics 10.

       Level of Validity of the Worksheet in Mathematics 10.

Scale	Range Interval	Verbal Interpretation
5	4.20 - 5.00	Very much Valid
4	3.40 – 4.19	Valid
3	2.60 – 3.39	Moderately Valid
2	1.80 – 2.59	Slightly Valid
1	1.00 – 1.79	Not Valid

       Pretest and posttest were given to the respondents to determine the level of students' Mathematics Performance.

       Legend for Student's Mathematics Performance.

Range Interval	Remark
25 – 30	Advance
19 – 24	Proficient
13 – 18	Approaching Proficient
7 – 12	Developing
1 – 6	Beginning

Scoring method was used as the basis for testing the hypothesis of this study at 5% level of significance using the statistical tools such as Weighted Mean to compute the data obtained in the validation and acceptability of the worksheet in terms of objectives, content, examples, assessment, design, clarity, appropriateness, and usefulness. Arithmetic Mean to compute the average score of the respondent in the pretest and posttest. Standard Deviation to measure the spread of the scores of the students in their pretest and post-test and lastly the t- Test to compute for the significant difference in the use of the material in terms of pretest and post-test. The researcher used computer, electronic forms and spreadsheet applications in tabulating and computing the statistics of the study.

Results and Discussion

Level of Validation of the Worksheet in terms of Objectives

Table 1 presents the level of validation of the worksheet as remedial materials in teaching mathematics 10 in terms of objective.

Table 1. Level of Validation of the Worksheet in terms of Objectives

Statement	Mean	Standard Deviation	Verbal Interpretation
1. Each lesson in the worksheet was accompanied by specific objectives.	5.00	0.00	Very much Valid
2. The objectives were well planned, formulated and organized.	4.93	0.25	Very much Valid
3. The objectives were measurable and attainable.	4.90	0.31	Very Much Valid
4. The objectives were aligned with the Most Learning Competencies in DepEd Curriculum.	5.00	0.00	Very Much Valid
5. The objectives describe a direction for the student acquiring new knowledge, skills, and attitudes.	4.93	0.25	Very Much Valid
Overall Mean	**4.95**	0.16	**Very Much Valid**

Legend:

Range Interval	Verbal Interpretation
4.20 – 5.00	Very Much Valid
3.40 – 4.19	Valid
2.60 – 3.39	Moderately Valid
1.80 – 2.59	Slightly Valid
1.00 – 1.79	Not Valid

Table 1 shows that the respondents extremely acceptable that the worksheet was accompanied by specific objectives (M = 5.00, SD = 0.00). The objectives were well planned, formulated and organized (M = 4.93, SD = 0.25). It was measurable and attainable (M = 4.90, SD = 0.31. It was aligned with the Most Learning Competencies in DepEd Curriculum (M = 5.00, SD = 0.00). It described
a direction for the student acquiring new knowledge, skills, and attitudes (M = 4.93,
SD = 0.25).

The overall mean of 4.95 further shows that the validity of the objectives of the worksheet was very much valid. Small standard deviation (SD = 0.13) indicates that the responses/ratings of the respondents were almost the same. This implies that the objectives of the worksheet guided the students as they work through the course and assessed their learning progress.

The findings for the validation of objectives of the worksheet was consistent by the findings of Lachlan-Hache (2012), stating that the objectives should include a statement of the teacher's intended learning outcomes. It also the foundation upon which you can build lessons, and instruction and assessment. This was also consistent with the statement of Kapur (2019) that the primary objectives of teaching – learning materials was to motivate learners toward the acquisition of education. These were primarily used by teachers to aid and support the learners to achieve academic outcomes. The results imply that the crafted objectives as part of the worksheet hit the targeted goal of this study.

Level of Validation of the Worksheet in terms of Content

Table 2 presents the level of validation of the worksheet as remedial materials in teaching mathematics 10 in terms of content.

Table 2. Level of Validation of the Worksheet in terms of Content

Statement	Mean	Standard Deviation	Verbal Interpretation
1. The content of each lesson reflects the most important aspect of what was being taught as provided by MELC.	4.90	0.31	Very much Valid
2. The content of each lesson was directly relevant to the defined objectives.	4.90	0.31	Very much Valid
3. The key concepts show the definition of terms related to the topics.	4.90	0.31	Very Much Valid
4. The topics were supported by examples and suited to the level of the students.	4.77	0.43	Very Much Valid
5. Each topic was given emphasis in the lesson.	4.93	0.25	Very Much Valid
Overall Mean	**4.88**	**0.32**	**Very Much Valid**

Legend:

Range Interval	Verbal Interpretation
4.20 – 5.00	Very Much Valid
3.40 – 4.19	Valid
2.60 – 3.39	Moderately Valid
1.80 – 2.59	Slightly Valid
1.00 – 1.79	Not Valid

Table 2 shows that the respondents extremely acceptable that the content of each lesson reflects the most important aspect of what was being taught as provided by MELC (M = 4.90, SD = 0.31). It was directly relevant to the define objectives (M = 4.90, SD = 0.31). It shows the definition of terms related to the topics (M = 4.90, SD = 031). It was supported by examples and suited to the level of the students (M = 4.77, SD = 0.43). Each topic was given emphasis in the lesson (M = 4.93, SD = 0.25).

The overall mean of 4.88 further shows that the validity of the content of the worksheet was extremely valid. A small standard deviation (SD = 0.17) indicates that the responses/ratings of the respondents were almost the same. This implies that the teacher needs to create or develop a suitable worksheet for the students.

Since the results show that the contents were valid, it was consistent with the statement of Mahsunah & Shobah (2022) that worksheets have an important role in the teaching and learning process to help teachers in conveying knowledge to students.

Level of Validation of the Worksheet in terms of Examples

Table 3 presents the level of validation of the worksheet as remedial materials in teaching mathematics 10 in terms of examples.

Table 3. Level of Validation of the Worksheet in terms of Examples

Statement	Mean	Standard Deviation	Verbal Interpretation
1. The examples given were based on the Grade 10 Most Learning Competencies.	5.00	0.00	Very much Valid
2. The examples given were aligned with the objectives of the lesson.	4.90	0.31	Very much Valid
3. Shows concepts related to the content of the lesson.	4.87	0.35	Very Much Valid
4. Provides activities that help learners apply their learning to a new situation or context beyond the lesson.	4.83	0.38	Very Much Valid
5. The examples were suited to the needs of the learners.	4.90	0.31	Very Much Valid
Overall Mean	**4.90**	**0.27**	**Very Much Valid**

Legend:

Range Interval	Verbal Interpretation
4.20 – 5.00	Very Much Valid
3.40 – 4.19	Valid
2.60 – 3.39	Moderately Valid
1.80 – 2.59	Slightly Valid
1.00 – 1.79	Not Valid

Table 3 shows that the respondents extremely acceptable that the examples given were based on the Grade 10 Most Learning Competencies (M = 5.00, SD = 0.00). It was aligned with the objectives of the lesson (M = 4.90, SD = 0.31). It shows concepts related to the content of the lesson (M = 4.87, SD = 0.35).
It provides activities that help learners apply their learning to a new situation or context beyond the lesson (M = 4.83, SD = 0.38). The examples were suited to the
needs of the learners (M = 4.90, SD = 0.31).

The overall mean of 4.90 shows that the validity of the examples of the worksheet was extremely valid. Small standard deviation (SD= 0.19) indicates that the responses/ratings of the respondents were almost the same. The results imply
that the crafted worksheet had sufficient and proper content in terms of samples.

The findings for the validation of examples of the worksheet was consistent with the statement of Mazgon & Stefanc (2012) that the inclusion of concrete examples concerning educational contents in educational materials was very important, whereas the view was shared by a great majority of the teachers. The reasons why almost one fifth of students do not place a high value on the use of concrete examples to illustrate educational concepts is a pertinent question that merits additional empirical research.

Level of Validation of the Worksheet in terms of Assessment

Table 4 presents the level of validation of the worksheet as remedial materials in teaching mathematics 10 in terms of examples.

Table 4. Level of Validation of the Worksheet in terms of Assessment

Statement	Mean	Standard Deviation	Verbal Interpretation
1. The assessment implemented program was accurate and was aligned to the design.	4.97	0.18	Very much Valid
2. The assessment was measurable in terms of the result in every activity and anchored in the objectives.	4.97	0.18	Very much Valid
3. Deftly designs assessment that consider to academic, social, and emotional needs of the learner.	4.90	0.31	Very Much Valid
4. Shows complete understanding of the questions, mathematical ideas, and process.	4.90	0.31	Very Much Valid
5. Evaluates the student's knowledge and understanding of the lesson.	4.93	0.25	Very Much Valid
Overall Mean	**4.95**	**0.32**	**Very Much Valid**

Legend:

Range Interval	Verbal Interpretation
4.20 – 5.00	Very Much Valid
3.40 – 4.19	Valid
2.60 – 3.39	Moderately Valid
1.80 – 2.59	Slightly Valid
1.00 – 1.79	Not Valid

Table 4 shows that the respondents extremely acceptable that the assessment implemented program was accurate and was aligned to the design (M = 4.97, SD = 0.18). It was measurable in terms of the result in every activity and anchored in the objectives (M = 4.97, SD – 0.18). It deftly designs assessment that consider to academic, social, and emotional needs of the learner (M = 4.90, SD = 0.31). It shows complete understanding of the questions, mathematical ideas, and process (M = 4.90, SD= 0.31). Evaluates the student's prior knowledge and understanding of the lesson (M = 4.93, SD = 0.25).

The overall mean of 4.93 shows that the validity of the assessment of the worksheet was extremely valid. Small standard deviation (SD = 0.35) indicated that the responses/ ratings of the respondents were almost the same. The results imply that it hit the targeted goal in assessment, as the crafted worksheets were great to test the learning outcomes of the students. This also implies that these worksheets can also be used to identify the weakness of the students and can also

be used effectively to understand the difficult concepts.

The findings on the validation of assessment of the worksheet was supported by Hasibuan, et.al. (2019) who stated that mathematical problem-solving abilities and student learning independence increases after learning using learning tools based on realistic mathematical approaches that have been developed. It shows that the quality of learning tools must have valid, practical, and effective criteria.

Level of Validation of the Worksheet in terms of Design

Table 5 presents the level of validation of the worksheet as remedial materials in teaching mathematics 10 in terms of design.

Table 5. Level of Validation of the worksheet in terms of Design

Statement	Mean	Standard Deviation	Verbal Interpretation
1. The design was well-organized which make the lesson more interesting.	4.87	0.35	Very much Valid
2. The design was suitable for a range of learning styles and instructional approaches.	4.87	0.35	Very much Valid
3. The language uses was clear, concise, and motivating.	4.90	0.31	Very Much Valid
4. The mathematical symbols used were well-defined.	4.97	0.18	Very Much Valid
5. The instructions in the worksheet were concise and easy to follow.	4.90	0.31	Very Much Valid
Overall Mean	**4.90**	**0.30**	**Very Much Valid**

Legend:

Range Interval	Verbal Interpretation
4.20 – 5.00	Very Much Valid
3.40 – 4.19	Valid
2.60 – 3.39	Moderately Valid
1.80 – 2.59	Slightly Valid
1.00 – 1.79	Not Valid

Table 5 shows that the respondents extremely acceptable that the design was well-organized which make the lesson more interesting (M = 4.87, SD = 0.35). It was suitable for the range of learning styles and instructional approaches (M = 4.87, SD = 0.35). The language uses were clear, concise, and motivating (M = 4.90, SD = 0.31). The mathematical symbols used were well-defined (M = 4.97, DS = 0.18). The instructions in the worksheet were concise and easy to follow (M = 4.90, SD = 0.31).

The overall mean of 4.90 shows that the validity of the design of the worksheet was extremely valid. Small standard deviation (SD = 0.12) indicates that the responses/ratings of the respondents were almost the same. Research results imply that positive changes in grades of presentational design for multimedia learning material led to positive changes of quality grade for multimedia learning material, especially in case of more qualitative multimedia learning material.

Findings on the validation of worksheets in terms of design were supported by Markovic (2012) says that to define the level at which students' grade of the presentational design for multimedia learning material has anticipated the grade of multimedia learning material's quality, a regression analysis has been conducted. Aesthetic experience is described in this essay as an experience that is qualitatively distinct from everyday experience and comparable to other exceptional mental states.

Level of Validation of the worksheet in terms of Clarity

Table 6 presents the level of validation of the worksheet as remedial materials in teaching mathematics 10 in terms of clarity.

Table 6. Level of Validation of the worksheet in terms of Clarity

Statement	Mean	Standard Deviation	Verbal Interpretation
1.The materials were clear to visualize.	4.93	0.25	Very much Valid
2. The size of the texts was large enough for students to see.	4.97	0.18	Very much Valid
3. The meaning of the texts was clear for students.	5.00	0.00	Very Much Valid
4. The materials clarify the items needed in the worksheet.	4.90	0.31	Very Much Valid
5. The examples of each lesson were presented clearly.	4.90	0.31	Very Much Valid
Overall Mean	**4.94**	**0.21**	**Very Much Valid**

Legend:

Range Interval	Verbal Interpretation
4.20 – 5.00	Very Much Valid
3.40 – 4.19	Valid
2.60 – 3.39	Moderately Valid
1.80 – 2.59	Slightly Valid
1.00 – 1.79	Not Valid

Table 6 shows that the respondents extremely acceptable that the worksheet was clear to visualize (M = 4.93, SD =0.25). The size of the text was large enough for the student to see (M = 4.97, SD = 0.18). The meaning of the texts was clear for the students (M = 5.00, SD = 0.00). The materials clarify the items needed in the worksheet (M = 4.90, SD = 0.30). The examples of each lesson were presented clearly (M = 4.90, SD = 0.31).

The overall mean of 4.94 shows that the validity of the clarity of the worksheet was extremely valid. Small standard deviation (SD = 0.12) indicates that the responses/ratings of the respondents were almost the same. This implies that the crafted worksheets have a clear instructions and contents that helped the students to understand the contexts clearly. Being clear about what you think and what you do was a critical step in taking responsibility for your current actions. Clarity allowed the students the freedom to design better possibilities for their actions. In this context, determining clear context became a strategy that students used to distinguish between what information in a text was most important versus what information was interesting but not necessary for understanding.

Findings on the evaluation of clarity of the worksheet supported by Blaich, C. et.al. (2016) stated that clear and organized instruction was also a positively related to the students' academic motivation and their beliefs that their faculty were committed to teaching and student development.

Level of Validation of the worksheet in terms of Appropriateness

Table 7 presents the level of validation of the worksheet as remedial materials in teaching mathematics 10 in terms of appropriateness.

Table 7. Level of Validation of the worksheet in terms of Appropriateness

Statement	Mean	Standard Deviation	Verbal Interpretation
1. The topics in the worksheet were appropriate to the level of the learners.	4.93	0.25	Very much Valid
2. The content of the lesson appropriate to the learning objectives.	5.00	0.00	Very much Valid
3. The examples were aligned to the learning objectives.	5.00	0.00	Very Much Valid
4. The worksheet as remedial materials promote an active quest for new information and ideas.	4.77	0.43	Very Much Valid
5. The materials maintain an atmosphere conducive to inquiry.	4.83	0.38	Very Much Valid
Overall Mean	**4.91**	**0.21**	**Very Much Valid**

Legend:

Range Interval	Verbal Interpretation
4.20 – 5.00	Very Much Valid
3.40 – 4.19	Valid
2.60 – 3.39	Moderately Valid
1.80 – 2.59	Slightly Valid
1.00 – 1.79	Not Valid

Table 7 shows that the respondents extremely acceptable that the topics in the worksheet were appropriate to the level of the learners (m = 4.93, SD = 0.25). The content of the lesson appropriate to the learning objectives (M = 5.00, SD = 0.00). The examples were aligned to the learning objectives (M = 5.00, SD = 0.00). The worksheet as remedial materials promote an active quest for new information and ideas (M = 4.77, SD = 0.43). The materials maintain an atmosphere conducive to inquiry (M = 4.83).

The overall mean of 4.91 shows that the validity of the appropriateness of the worksheet was extremely valid. Small standard deviation (SD = 0.17) indicates that the responses/ratings of the respondents were almost the same. This implies that worksheets helped the students to improve the results of their performance, hence, they have seen a great improvement in their performance after using the worksheets.

The findings of validation of the worksheet in terms of appropriateness was consistent with the statement of Shrikant (2021) that worksheets with appropriate contents for specific type of learners were great teaching resources.

Level of Validation of the worksheet in terms of Usefulness

Table 8 presents the level of validation of the worksheet as remedial materials in teaching mathematics 10 in terms of usefulness.

Table 8. Level of Validation of the worksheet in terms of Usefulness

Statement	Mean	Standard Deviation	Verbal Interpretation

1. The worksheet was a useful supplementary instructional material in teaching Mathematics 10.	5.00	0.00	Very much Valid
2. The worksheet serves as a learning material to help the students to understand the topics at their own pace.	4.80	0.41	Very much Valid
3. The learning material will allow the students to use their time more efficiently.	4.97	0.18	Very Much Valid
4. The worksheet uses by the students for enhancing their mathematical ability and understanding the concepts of the topics.	4.97	0.18	Very Much Valid
5. The learning outcomes were identified through the materials provided in the worksheet.	5.00	0.00	Very Much Valid
Overall Mean	**4.91**	**0.21**	**Very Much Valid**

Legend:

Range Interval	Verbal Interpretation
4.20 – 5.00	Very Much Valid
3.40 – 4.19	Valid
2.60 – 3.39	Moderately Valid
1.80 – 2.59	Slightly Valid
1.00 – 1.79	Not Valid

Table 8 shows that the respondents extremely acceptable that the worksheet was a useful supplementary instructional material in teaching Mathematics 10 (M = 5.00, SD = 0.00). It serves as a learning material to help the students to understand the topics at their own pace (M = 4.80, SD = 0.41). The learning materials will allow the student to use their time more efficiently (M = 4.97), SD = 0.18). It uses by the students for enhancing their mathematical ability and understanding the concepts of the topics (M = 4.97, SD = 0.18). The learning outcomes were identified through the materials provided in the worksheet (M = 5.00, SD = 0.00).

The overall mean of 4.95 shows that the validity of the usefulness of the worksheet was extremely valid. Small standard deviation (SD = 0.10) indicates that the responses/ratings of the respondents were almost the same. This implied that the crafted student worksheets have several benefits, including students being able to the learning competencies, improve students' critical thinking skills and being more motivated in learning.

The findings on the evaluation of usability of the worksheet was supported by Nielsen (2012) stated that usability of material was quality attributes that assess the learner to use the material.

Student's Mathematics Performance in terms of Pretest and Posttest

Table 9 presents the respondents level of student's mathematics performance in terms of pretest and posttest

Table 9: Student's Mathematics Performance in terms of Pretest and Posttest

	Mean	SD	Remarks
Pretest	10.17	6.76	Developing
Posttest	21.15	2.66	Proficient

Legend:

Range Interval	Verbal Interpretation

25.00 – 30.00	Advanced
19.00 – 24.00	Proficient
13.00 – 18.00	Approaching Proficient
7.00 – 12.00	Developing
1.00 – 6.00	Beginning

Table 9 shows that the pretest mean score (M = 10.17) was at its developing level while the posttest mean (M = 21.15) was remarkably proficient. This was supported by Augustine (2015), stated that students learned the material over the semester as indicated by the overall increase in students' ability. Changes in questions difficulty provide evidence for the importance of practice when learning concepts. The results imply that the most important aspect considered in crafting the worksheets were the learning ability and approach of the students. The students tend to love to have fun even when learning. Keeping this fact in mind, these worksheets were designed in simpler way and was filled with many pictorial exercises which students would certainly enjoy doing. These factors greatly affected the students' way of learning, which can be seen on their posttest scores.

Significant difference on Students' Mathematics Performance in terms of Pretest and Posttest

Table 10 represents the significant of difference in the Math Performance students' mathematics performance in terms of pretest and posttest.

Table 10. Significant difference on Students' Mathematics Performance in terms of Pretest and Posttest.

Test	Mean	SD	t- value	t	p	Analysis
Pretest	10.17	6.76	23.4	1.65	<0.01	Significant
posttest	21.15	2.66				

Note: Difficulty at 0.01 level; Hypothesis tested at α =0.05

Table 10 shows the significant difference on students' mathematics performance in terms of pretest and posttest. The level of ability of students in the posttest was (21.15, SD = 2.66) was statistically significantly higher than that in pretest (M10.17, SD = 6.76). At 0.05 level of significance with computed t- value = 23.4, t-critical value 1.65 and p= <0.01.

The developed worksheet as a remedial material in teaching mathematics was a good tool in improving learners' mathematics performance because it contains activities suited to the learner and easy to follow. The findings for the significant difference on the use of worksheet to the learners' performance in Mathematics in terms of the pretest and posttest was supported by Shivaraju, Manu, Vinaya, & Savkar, (2017) stated that if a pretest was given immediately before teaching, improve the performance in a subsequent posttest. The study was also used to assess the educational value of a structured teaching method. Pre- and post- test designs were widely used in behavioral research. Increasing the knowledge of students has a direct positive impact in teaching method. The application of a pretest was observed to be a feasible tool to shape group specific education program. The results also implied that the crafted worksheets offered a unique learning avenue to the students. They were not only fun to do but even facilitate ease of learning and knowledge retention in their minds. It has become a great source of imparting value education to their thoughts. They found it interesting, engaging, and thought-provoking.

Summary of Findings

Based on the data presented, analyzed, and interpreted the following were the findings:
The worksheet was given by a remark of extremely valid in all its component's characteristics such as the objectives, content, examples, assessment, design, clarity, appropriateness, and usefulness. The workbook

serves as a guide for the students to understand the lesson well. It also promotes the students' ability to enhance their knowledge and understanding in different situations pertaining to the topic.

The students showed developing level of performance in their pretest while in the posttest, they showed proficiency level of performance as shown by the computed mean. The workbook helps the students to unlock their difficulties in solving problems for a certain topic.

The result also revealed that there was a significant difference on the use of worksheet and students' performance in Mathematics based on their pretest and posttest.

Conclusion

Based on the findings, it was concluded that:

The null hypothesis indicating that there was no significant difference on the use of worksheet and students' performance based on their pretest and posttest was hereby rejected. Rejection of the null hypothesis shows that the worksheet was effective as a remedial material in teaching Mathematics 10 specifically on topics involving permutations, combinations, and probability.

Recommendations

From the findings and conclusions drawn, the following were hereby recommended for consideration.

1. The school administrators may encourage teachers to create learning material as a supplementary material that support the needs of learners to have mastery of the topic.

2. Teachers should adapt the use of worksheet as a remedial material in teaching Mathematics and as part of teaching methodology of the teacher to increase learners' academic performance.

3. Teachers were encouraged to develop worksheet as a remedial material teaching not only in Mathematics but also in other areas of learning.

Different salient points were found after to conduct of the research. Therefore, based on the different findings of the study, the following findings are hereby enumerated based on the statement of the problem:

1. Most of the teachers have ICT facilities available for their teaching as 25.2% has Personal Computers, 91.6% has Laptop, 86% has Internet /Wifi and Printer, and 89.7% has Android phone/Smart Phone, 36.4% has a scanner, and 0.9% has a Mobile phone. This only shows that most teachers have enough gadgets to use in teaching English.

2. In terms of Teachers' Expertise on different ICT Skills and Programs, most of the teachers have "VERY HIGH EXPERTISE," specifically in using MS Word, MS Excel, MS PowerPoint, Google Forms, Searching/Browsing on the Internet, Social Networks (e.g., Zoom, Google Meet, etc.), Google Classroom, Email, File Attachment, and Windows & File Management. This only implies that most teachers in Majayjay District can manipulate/ have enough expertise in using different software applications used in teaching English.

3. Teachers teaching English in Majayjay District perceive the issues and challenges in the use of ICT in teaching with "VERY HIGH CHALLENGE," specifically in terms of External Variables, Perceived Usefulness, Perceived Ease-of-Use (PEOU), Attitude Towards Use, and Social Influence Processes.

4. The relationship between a Teachers' Expertise on Software Application and the Issues and Challenges in the Use of Software Application in Teaching has a Significant Relationship with the Perceived Usefulness; Perceived Ease-of-Use (PEOU); Attitude toward Use, and Social Influence Processes and do Not Have a Significant Relationship with External Variables and Behavioral Intention.

Conclusion

Based on the different findings of the study, the following conclusions are hereby concluded based on the statement of the problem:

Teachers' expertise on the use of ICT software applications is partly significantly related to the issues and challenges in the use of software applications in teaching except to external variables and behavioral intention. Therefore, the null hypothesis "Teachers' expertise on software applications is not significantly related to the issues and challenges in the use of software applications in teaching" is partly rejected.

Recommendations

From the said conclusions, the following recommendations were presented:

1. The school/ the division may provide additional support for teachers in having enough ICT facilities available for teachers by strengthening their ICT package programs granting teachers necessary facilities in teaching using ICT.
2. The Department of Education, specifically the Division or School may continue, formulate, or strengthen ICT skills and programs training for teachers. This could be in the form of School Learning Action Cells (SLACs), In-Service Training (INSET) or even a Webinar or Physical attendance to Seminars.
3. Software Application Developers may provide trainings for teachers on other software applications emerging that can be used for teaching as additional avenue to enhance their professional development.
4. Future Researchers may venture more on the Expertise on ICT and Software Application Skills as well as Issues and Challenges on a wider area of study for more accurate results.

References

Aggarwal, R. & Ranganathan, P. (2019). Study designs: Part 2 – Descriptive studies. Perspectives in Clinical Research. https://doi.org/10.4103/picr.PICR_154_18

Alcober, N. (2020). Briones: No Filipino learner left behind. Daily Tribune. https://tribune.net.ph/index.php/2020/06/24/briones-no-filipino-learner-left-behind/

Augustine, Jill & Slack, Marion & Warholak, Terri. (2015). A pre- and post-test assessment of concept learning in research design. Currents in Pharmacy Teaching and Learning 7(6):729-737. https://doi.org/10.1016/j.cptl.2015.08.006

Best, J. (2020). 12 Effective Teaching Strategies for Every Teacher Toolkit. https://www.3plearning.com/blog/12-effective-teaching-strategies-every-te acher-toolkit/

Blaich C., Wise, K., Pascarella, E. & Roksa, J. (2016). Instructional Clarity and Organization: It's Not New or Fancy, But It Matters. Change The Magazine of Higher Learning Volume 48, 2016 - Issue 4. https://doi.org/10.1080/00091383.2016.1198142.

Cantonjos J. & Janer, S. (2022). Effectiveness of Utilizing Learning Activity Sheets to Improve the Solving Skills involving Sampling Distribution of Grade 11 Students. United International Journal for Research & Technology. https://uijrt.com/articles/v3/i8/UIJRTV3I80007.pdf

Cherry, K. (2021). Self-Determination Theory and Motivation. Very Well Mind. https://www.verywellmind.com/what-is-self-determination-theory-2795387 #:~:text=According%20to%20self-determination%20theory%2C%20peopl e%20need%20to%20feel,sense%20of%20belonging%20and%20attachment%20to%20other %20people.

Chiu, T. K. (2022). Applying the self-determination theory (SDT) to explain student engagement in online learning during the COVID-19 pandemic. Journal of Research on Technology in Education, 54(sup1), S14-S30. https://doi.org/10.1080/15391523.2021.1891998

Etikan, I. & Bala, K. (2017). Sampling and sampling methods. Biometrics & Biostatistics International Journal. https://doi.org/10.15406/bbij.2017.05.00149

Hasibuan, A., Saragih, S. & Amry, Z. (2019). Development of Learning Materials Based on Realistic Mathematics Education to Improve Problem Solving Ability and Student Learning Independence. International Electronic Journal of Mathematics Education. https://doi.org/10.29333/iejme/4000

Kapur, R. (2019). Development of Teaching – Learning Materials. University of Delhi. https://www.researchgate.net/publication/334083571_Development _of_Teaching-Learning Materials.

Lachlan-Hache, L. (2012). Student Learning Objectives as Measures of Educator Effectiveness. American Institute for Research. https://files.eric.ed.gov/fulltext/ED565765.pdf

Lopez-Garrido, G. (2021). Self-Determination Theory and Motivation. Simply Psychology. https://www.simplypsychology.org/self-determination-theory.html

Mahsunah, E., & Shobah, N. (2022). Developing Student's English Worksheet On Reading Materials for Tenth Grade. Lintang Songo: Jurnal Pendidikan, 5(1), 19-25. https://journal.unusida.ac.id/index.php/jls/article/download/571/392/ 1449

Markovic, S. (2012). Components of Aesthetic Experience: Aesthetic Fascination, Aesthetic Appraisal, and Aesthetic Emotion. SAGE Journal, I-Perception. https://doi.org/10.1068/i0450aap

Mazgon, J., and Stefanc, D. (2012). Importance of the Various Characteristics of Educational Materials: Different Opinions, Different Perspectives. TOJET: The Turkish Online Journal of Educational Technology. https://files.eric.ed.gov/fulltext/EJ989210.pdf

Nielsen, J. (2012). Usability 101: Introduction to Usability. NN Group Nielsen Norman Group. https://www.nngroup.com/articles/usability-101-introduction-to-usability/

Sambayon, H. (2020). Utilization of Contextualized Teacher-Made Activity Sheets in Teaching Mathematics 5 Learners and Their Academic Performance. https://www.researchgate.net/profile/Hazellel_Mae_Sambayon/publication/346014392_Utilization of Contextualized Teacher-Made Activity Sheets in Teaching Mathematics 5 Learners and Their Academic Performance/links/5fb5e74b92851c933f3d52c6/Utilization-of-Contextualized-Teach er-Made-Activity-Sheets-in-Teaching-Mathematics-5-Learners-and-Their-Academic-Performance

Shivaraju P.T., Manu G., Vinaya M & Savkar, M.K. (2017). Evaluating he Effectiveness of Pre- and Post- Test Model of Learning in Medical School National Journal of Physiology, Pharmacy and Pharmacology. https://doi.org/10.5455/njppp.2017.7.0412802052017

Shrikant (2021). Importance of worksheets. Mera Home Tutor. https://www.merahometutor.com/blog/61/Importance-of-worksheets.html