

# COMIC STRIPS: AN INNOVATIVE MATERIAL IN TEACHING TLE-TECHNICAL DRAFTING CONCEPTS

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**ABSTRACT:** *The unavailability of learning materials and students' low performance in drafting subjects compelled the researchers to develop and appraise comic strips in technical drafting. The researchers employed a combination of design-development and quasi-experimental research design in this study. The evaluators utilized an adapted evaluation rating sheet as a tool to appraise the content, format, presentation organization, accuracy, and up-to-dateness of the developed comic strips. The researchers conducted pretest and posttest to compare students' performance before and after the students were exposed to different learning materials. The findings revealed that the developed comic strips based on the LRMDS standards obtained a very satisfactory evaluation rating. It was also revealed the experimental group (Comic Strips) had a significantly higher mean score compared to that of the control group (LAS) during the posttest and it showed a significant increase in their posttest score after being exposed to the developed comics strip. Findings also revealed that there is a significant difference in the scores of the students after being exposed to the different learning materials.*

**Keywords:** Comic Strips, innovative material, Learning Activity Sheets (LAS), Learning Resources Management and Development System (LRMDS)

## INTRODUCTION

Since its outbreak in late December 2019, COVID-19 has created havoc across the world, and like any critical sector, education has been hit hard. Students, schools, colleges, and universities have been extremely impacted. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO) [1], over 800 million learners from around the world have been affected, 1 in 5 learners cannot attend school, 1 in 4 cannot attend higher education classes, and over 102 countries have ordered nationwide school closures while 11 have implemented localized school closure (Global Campaign for Education).

In the Philippines, the Department of Education made use of modular learning as one of the modalities. Modular learning as a form of distance learning uses Self-Learning Modules (SLM) based on the most essential learning competencies (MELCS) provided by DepEd. The educational modules include sections dedicated to motivation and assessment, serving as a comprehensive guide for both teachers and students to achieve desired competencies. Teachers actively monitor learners' progress through methods like home visits and feedback mechanisms, guiding students who require special attention (Manlangit et al., 2020).

In the Philippines, modular learning stands out as the most popular form of distance education. It's currently utilized by all public schools, backed by a survey conducted by the Department of Education (DepEd). The survey found that parents with children enrolled in this academic year strongly prefer learning through printed and digital modules over other distance learning methods.

This is also in consideration of the learners in rural areas where the internet is not accessible for online learning (Bernardo, J. 2020) [3]. However, there are some problems seen as modular learning is implemented in the current situation. In the case of the TLE-7 Technical drafting subject in Carrascal National High School, the use of Learning Activity Sheets (LAS) as materials for modular learning seems to be not enough to enhance students' performance in accomplishing specific competencies. As reflected in the students' scores in the previous year during the 4<sup>th</sup> quarter

activities for specific competencies, the students got a Mean Percentage Score (MPS) of 56.63% which is below the Proficiency level of 75%. Additionally, out of the 35 students, only 16, or 45.71% were able to achieve the level of being Proficient and Highly Proficient leaving the 54.91% to settle with Nearly Proficient, Low Proficient, and Not Proficient levels. This might be attributed to the limited contents and learning activities being presented in the Learning Activity Sheets (LAS) given to the students.

The enriched curriculum as one of the salient features of the K-12 program covers contextualization that is flexible enough to enable and allow schools to localize, indigenize, and enhance the curriculum based on their respective educational, social, technological, and global context (R.A. 10533). The Division of Surigao del Sur through the Learning Resource Management Section (LRMS) is promoting the contextualization and development of local materials to address the demand for the absence of ICT and launching more interesting IMs in the rural context, a non-electronic material such as Learning Activity Sheets (LAS), magazines, and comic strips.

In the context of presenting T.L.E.-related contexts and tasks, several different tools have been suggested to directly include intuitive understanding for students and make it more motivating and comprehensible to them. Visual tools are seen as especially important for providing information and embedding it into comprehensible learning situations. One creative way to do this is the use of cartoons or comics (Kennepohl & Roesky, [4]. Tatalovic [5] as cited by Affeldt, et. al. [6], comics, whether they are digital media based or traditionally printed on paper, generally belong to the media world of the younger generation. The popularity of comics has been suggested as a cause of both the higher visual literacy and of the decreasing reading skills of today's students. More so, comics visualize stories, are viewed as comprehensible to students, and also allow teachers to connect technical tasks with authentic situations taken from students' lives [6].

With the current situation and existing ideas on comic strips as instructional materials, and to address the least learned competencies of the Grade 7 TLE- Technical Drafting

students, the researchers sought to assess the efficacy of comic strips in the teaching-learning process. The researcher used a different comic strip called SIRMICS (Strategic, Interactive, and Reflective Materials to Improve Creativity Skills) Comics as an innovative material for improving students' performance in a specific T.L.E. Technical Drafting concept. SIRMICS comics are designed to help students master a competency-based skill that they were not able to develop during the regular Modular Distance Learning (MDL) modality using Learning Activity Sheets (LAS) which have limited contents and learning activities.

This study aimed to determine the effectiveness of Comics Strips as an innovative material in teaching Technical Drawing concepts specifically converting 2D technical drawings to 3D objects in Grade 7 students at Carrascal National High School and Cantilan National High School.

The study sought to answer the following questions:

1. What is the evaluation rating of the developed comic strip in terms of:
  - 1.1 Content
  - 1.2 Format
  - 1.3 Presentation and Organization
  - 1.4 Accuracy and Up-to-datedness of Information
2. What is the pretest and posttest mean scores of the control and experimental group?
3. Is there a significant difference between the pretest and posttest mean scores of the control and experimental groups?
4. What activity plan can be made to maximize the utilization of the developed material?

$H_0$ : There is no significant difference between the pretest and posttest mean scores of the control and experimental group.

This study focused on determining the effectiveness of a developed intervention material called SIRMICS Comics in increasing the academic and technical performance of TLE-Technical Drafting 7 students. The identified respondents in this study were the Grade 7 STE students taking the subject TLE-Technical Drafting/Creative Technologies of Carrascal National High School and Cantilan National High School. The topics included in the comic strips comprised the identified least learned competencies specifically converting and creating 2D technical drawings to 3D objects. The study was conducted during the 4<sup>th</sup> quarter of the academic year 2021 – 2022.

The following key terms used in the study are defined operationally to facilitate an easy understanding of the terminologies.

**Comic Strips.** It is the learning material that is developed by the researcher. It contains a visual presentation of a study narrated through drawings with little words written in the box.

**Control Group.** These are the students who will use the existing LAS during the implementation of the study.

**Experimental Group.** These are the students who will use the validated comic strips during the implementation of the study.

**LAS.** Stands for Learning Activity Sheets. These are worksheets used in Modular Distance Learning (MDL) modality. These materials were crafted by the subject teachers and evaluated by the experts based on Alternative

Delivery Mode (ADM) Modules with lesser or minimal content and limited learning activities aimed to level off in the capacity of the majority of learners. These are the existing modules used by the researcher in the previous year.

**LRMDS – Learning Resources Management and Development System.** A system designed to support increased distribution and access to learning, teaching, and professional development resources of DepED.

**SIRMICS.** Stands for Strategic, Interactive, and Reflective Materials to Improve Creativity Skills. It is the title of the developed material used by the researcher.

## MATERIALS AND METHODS

A combination of design development and quasi-experimental design was employed in this study. It is said developmental and experimental type of research because developed comics were utilized as instructional material in teaching comprehensive topics about Drawing 3D objects in Grade 7 TLE-Creative Technologies, under the learning competencies code SSP\_TLE-CT7CTDM -IVa-c-5.1 also known as Convert and Create 2D Technical Drawing to 3D Objects of the K to 12 Basic Education Curriculum Guide

For the quasi-experimental, the study used the pre-test and post-test quasi-experimental methods to determine the effectiveness of comic strips on the performance of Grade 7 students in TLE-Creative Technologies having technical drawing concepts. The design is the same as the classic control experimental design wherein the mean score results of the students tapped as subjects of the study were treated with comic strips and will be compared with the mean score result of the students who will be taught in the standard method of teaching using LAS.

This study was conducted on the Grade 7 STE students of Carrascal NHS and Cantilan NHS under the TLE-Creative Technologies subject, School Year 2021-2022. These locales were purposely chosen since these schools offer STE track that includes Technical Drawing concepts in the subject TLE-Creative Technologies with identified least mastered competencies during the implementation of modular distance learning modality in the school year 2020-2021.

The researcher used the purposive sampling method. One Grade 7 STE section from Carrascal NHS comprised 25 students and one Grade 7 STE section from Cantilan NHS with 25 students were utilized. With this, Grade 7 STE from Carrascal NHS was assigned as the Control group who were exposed to the existing LAS. While, another group, Grade 7 STE from Cantilan NHS was considered as an Experimental Group and was exposed to the validated comic strips.

The tools that were used in the study include the Developed Comic Strips, the Standardized Evaluation Rating Sheet for Developed / Redeveloped / Contextualized Learning Resources of the Department of Education, and the Pretest Post-test Questionnaire.

### 1. Developed Comic Strips (SIRMICS)

SIRMICS stands for Strategic, Interactive, and Reflective Materials to Improve Creativity Skills. It is an innovative material designed to improve students' performance in specific TLE-Technical Drafting Concepts. The material is a combination of activity sheets and comic strips which students can find engaging because it is composed of

interesting learning tasks and illustrations that will motivate students to learn. SIRMICS is designed to help students master a competency-based skill that they were not able to develop during the regular Modular Distance Learning (MDL) modality using Learning Activity Sheets (LAS) which have limited contents and learning tasks.

- Standardized Evaluation Rating Sheet for Developed/Redeveloped/Contextualized Learning Resources of the Department of Education.

The assessment tool that was used to evaluate the developed material was adapted from the Department of Education - Surigao del Sur Learning Resources Management and Development System (LRMDS). It is a Standardized Evaluation Rating Sheet for Developed/Redeveloped/Contextualized Learning Resources of the Department of Education.

- Research Questionnaire

This questionnaire was used during the pre-test and post-test. This was reviewed and checked by a master teacher and a subject coordinator in the TLE subject. It is a 25-item pre-test and post-test questionnaire that was used to measure the effectiveness of the developed comic strips as instructional material. The items of the questionnaire are all taken from the assessment activities of the Grade 7 TLE-Technical Drafting Learning Materials.

*Data Gathering Procedures*

The researcher started with crafting the storyline or the script for the material. After the crafting of SIRMICS, the developed material was subjected to evaluation by the master teacher and experts in the field. After being evaluated, a letter requesting permission to conduct the study was sent to the Schools Division Superintendent. Upon approval, a letter request was sent to the principals of the respondent schools. After this, arrangements were made on when to implement the teaching with the use of intervention material/SIRMICS and teaching with the use of traditional (using LAS). The researcher informed the respondents about the study and how to use the developed comic strips. The researcher strictly followed the protocols and processes in the distribution and collection of the materials (SIRMICS and LAS). In the case of STE students from Cantilan National High School, a letter of consent and assent was secured before the start of the conduct of the study.

During the implementation stage, the researcher administered a pre-test before the conduct of the study using the tool and the module to the different groups of learners. The post-test was conducted after the allotted time frame for the identified topics (Least Learned Competencies). After the implementation, the data gathered were tabulated and subjected to statistical analysis.

To give an in-depth analysis, the following statistical tools were used. Weighted Mean was utilized to determine the evaluation rating of the developed comic strip. Mean and Standard Deviation were used to determine the respondents' pre-test and post-test performance. T-test was used to test the significant difference between the mean scores of the two groups during the pre-test and post-test.

**RESULTS AND DISCUSSION**

**Table 1. Evaluation rating of the developed comic strip based on Content, Format, Presentation and Organization, and Accuracy and Up-to-datedness of Information**

Based on the LRMDs standards, Table 1 shows the evaluation rating of the developed comic strip. The Content gained an average weighted mean of 3.86 which has a verbal

Content	Weighted Mean	Verbal Description
1. Content is suitable to the student's level of development.	4.00	Very Satisfactory
2. Material contributes to the achievement of specific objectives of the subject area and grade/year level for which it is intended.	4.00	Very Satisfactory
3. Material provides for the development of higher cognitive skills such as critical thinking, creativity, learning by doing, inquiry, problem solving, etc.	4.00	Very Satisfactory
4. Material is compliant to the DepEd social content guidelines.	3.67	Very Satisfactory
5. Material enhances the development of desirable values and traits	3.67	Very Satisfactory
6. Material has the potential to arouse interest of target reader.	4.00	Very Satisfactory
7. Adequate warning/cautionary notes are provided in topics and activities where safety and health are of concern.	3.67	Very Satisfactory
<b>Average Weighted Mean</b>	<b>3.86</b>	Very Satisfactory
Format	Weighted Mean	Verbal Description
1. Print	3.92	Very Satisfactory
2. Illustration	3.78	Very Satisfactory
3. Design and Lay-out	3.75	Very Satisfactory
4. Paper & Binding	4.00	Very Satisfactory
5. Weight and Size of Resource	4.00	Very Satisfactory
<b>Average Weighted Mean</b>	<b>3.89</b>	Very Satisfactory

Presentation and Organization	Weighted Mean	Verbal Description
1. Presentation is engaging, interesting, and understandable.	3.67	Very Satisfactory
2. There is logical and smooth flow of ideas.	3.67	Very Satisfactory
3. Vocabulary level is adapted to target reader's likely experience and level of understanding.	4.00	Very Satisfactory
4. Length of sentences is suited to the comprehension level of the target reader.	4.00	Very Satisfactory
5. Sentences and paragraph structures are varied and interesting to the target reader.	3.67	Very Satisfactory
<b>Average Weighted Mean</b>	<b>3.80</b>	Very Satisfactory
Accuracy and Up-to-datedness of Information	Weighted Mean	Verbal Description
1. Conceptual errors.	3.67	Not Present
2. Factual errors.	3.67	Not Present
3. Grammatical errors.	4.00	Not Present
4. Computational errors.	3.67	Not Present
5. Obsolete information.	3.67	Not Present
6. Typographical and other minor errors (e.g., inappropriate or unclear illustrations, missing labels, wrong captions, etc.).	3.67	Not Present
<b>Average Weighted Mean</b>	<b>3.72</b>	Not Present

description of Very Satisfactory. This means that the evaluators are very satisfied with the contents presented in the developed learning material. It is also shown in the table in terms of content, that indicators 4, 5, and 7 have a little less rating compared with the other indicators. In means that the evaluators have a little less satisfaction with the developed comic strip's content as to compliance to DepEd social

content guidelines, development of desirable values and traits, and provision of adequate warning/cautionary notes in topics and activities where safety and health are a concern.

In terms of Format, the developed comic strip gained an average weighted mean of 3.89 with a verbal description of Very Satisfactory. This means that the evaluators are very satisfied with the format being applied in the developed material. It is also shown in the table that indicators 4 and 5 have the highest rating which means that the evaluators are very satisfied with the developed materials' paper and binding, and its weight and size. On the other hand, indicator 3 gained a little less rating compared with the other indicators. This means that the evaluators are a little less satisfied with the developed comic strips' design and layout.

In terms of Presentation and Organization, the developed comic strip gained an average weighted mean of 3.80 with a verbal description of Very Satisfactory. This means that the evaluators are very satisfied with the developed materials' presentation and organization. It is also shown in the table that while indicators 3 and 4 have a perfect rating of 4.00, indicators 1, 2, and 5 have a little less rating of 3.67. This means that the evaluators are not perfectly satisfied with how engaging, interesting, and understandable the presentation is, how logical and smooth the flow of ideas is, and how sentences and paragraph structures vary and make it interesting to the target readers.

Lastly, the table also shows the evaluators' ratings in terms of Accuracy and Up-to-dateness of Information. As shown in the table, it gained an average weighted mean of 3.72 with a verbal description of Not Present. This means that the evaluators have observed very minimal presence of errors with the developed material's information accuracy and up-to-dateness. While indicator 3 gained a perfect rating of 4.00, the other indicators gained a uniform rating of 3.67. This means that the evaluators have seen very minimal conceptual, factual, computational, and typographical errors.

The findings relate to the study conducted by Torrefranca [7] that focused on the development and validation of instructional worksheets as supplementary material to help the students improve their mastery and help the students catch up with missed lessons. Findings revealed that all the evaluators agreed that the instructional material satisfied the criteria, leading to mastery of the lessons.

**Table 2. Pretest and Posttest mean scores of the control and experimental group**

Group	N	Pretest		Post-test	
		Mean	SD	Mean	SD
Control (LAS)	25	8.88	2.920	12.72	2.807
Experimental (Comics)	25	8.28	2.762	17.40	2.701

Table 2 presents the pretest and posttest mean scores of the control and the experimental group. As shown in the table, the control group has a little higher mean score of 8.88 during the pretest than that of the experimental group with 8.28. This means that the control group has a bit better performance in the pretest compared to the experimental group. However, during the posttest, the experimental group obtained a mean

score of 17.40 which is higher compared to that of the control group which gained a mean score of 12.72. This means that the experimental group using the developed comic strip performed better during the posttest than the group using the traditional LAS. Furthermore, the experimental group has a lesser standard deviation value of 2.701 compared to the 2.807 of the control group. This means that the scores of the experimental group are more clustered closer to the mean compared to the more dispersed scores of the control group. Moreover, a higher mean score of 17.40 during the posttest compared to 8.28 during the pretest means that the students in the experimental group gained a significant increase in their performance after being exposed to the developed comic strip.

The use of high-quality curriculum and instructional materials leads to significant gains in students' achievement. The result confirms the claim of Steiner (2017) [8] that strengthening curriculum and instructional materials leads to an increase in student achievement. Moreover, the result conforms to the result of the study conducted by Prado (2019) [9] which found that the utilization of instructional materials had shown potential effectiveness in enhancing students' performance and strengthening positive attitudes and firm self-efficacy beliefs among students.

**Table 3. Significant values on the difference between the pretest and posttest mean scores of the control and experimental group**

Table 3 presents the significant values on the difference between the pretest and posttest mean scores of the control and the experimental group. As shown in the table, the computed t-value of 0.746 during the pretest has a p-value of

Group	Pretest	S.D.	t-value	p-value	Decision	Interpretation
Control (LAS)	8.88	2.920	0.746	0.459	Failed to reject H <sub>0</sub>	No Significant difference
Experimental (Comics)	8.28	2.762				
Group	Post-test	S.D.	t-value	p-value	Decision	Interpretation
Control (LAS)	12.72	2.807	6.067	0.000	Reject H <sub>0</sub>	There is a significant difference
Experimental (Comics)	17.40	2.646				

0.459. Having a p-value that is greater than the critical value of 0.05, we fail to reject the null hypothesis and it is interpreted that there is no significant difference between the pretest scores of the control and the experimental group. This means that the scores between the two groups during the pretest do not significantly differ. However, during the posttest, the computed t-value of 6.067 has a p-value of 0.000. Having a p-value that is less than the critical value of 0.05, the null hypothesis is rejected and it is interpreted that there is a significant difference between the posttest mean scores of the two groups. This means that the higher scores of the experimental group significantly differ from the scores of the control group. This means further that the experimental group significantly performed better than the control group after being exposed to the developed comic strips.

The findings conform to the result of the study conducted by Casumpang & Enteria [10] on the effectiveness of developed comic strips as instructional material for teaching specific

science concepts. The study discovered that the comic strip they created turned out to be a pretty handy tool for teaching science stuff, especially about waste generation and management. The experts who checked it out thought it was not too shabby and even gave it a thumbs up. Plus, when they looked at how well people did before and after using it, they found there was a clear improvement in understanding.

### CONCLUSIONS

Based on the findings, the researchers concluded that the developed comic strip as a learning material obtained a very satisfactory rating based on the LRMDs Standards. The developed comic strip can also be of great help to students in increasing their performance in TLE - drafting. Lastly, the developed comic strip is effective innovative material that can significantly increase students' performance in their drafting subject compared to the existing Learning Activity Sheets

### RECOMMENDATIONS

Based on the conclusions, the following recommendations are given:

1. SIRMICS Comics as a learning material may be recommended for teachers to use in teaching specific Technical Drawing concepts.
2. Administrators may be advised to provide teachers with training on instructional material development to be utilized in the classroom setting as a supplemental teaching aid.
3. Drafting students are also encouraged to use the developed comic strips to experience other learnings aside from the traditional Learning Activity Sheets (LAS).
4. For future researchers, the researcher encourages and recommends conducting studies related to the present study.

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