Simplified Supplementary Guide to Technical Drawing Under DepED STVEP Competency-Based Curriculum

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Abstract- ***The training guide is intended to assist learning providers handling Technical Drawing subjects for Grades 7 and 8 students as it provides them with a clear guide as to the sequence of particular topics to be covered in a specific grade level and timeline. The training guide is formulated based on the researcher's study on students' perception of instruction, competencies, interest, and availability of facilities; and performance of Grade 9 students during their previous years of attendance in Technical Drawing classes. Interrelationship of competencies and performance in the pursuit of knowledge, skills, and the right attitude to their studies following the K-12 program is the top priority of DepEd. Strengthened Technical-Vocation Education Program or STVEP stimulates the readiness of Grades 7 and 8 students as they will explore several areas of Technical-Vocational Education. Acquisition of technical knowledge and skills is essential to students enrolled in the curriculum. In his emphasis on the Law of Readiness, Thorndike states that learning is not meaningful unless the recipient is well motivated and prepared. The technical drawing has become one of the essential platforms of students' readiness in Technical-Vocational Education courses.***

Indexed Terms- ***Technical Drawing, Technical-Vocational Education, Training Guide***

I. INTRODUCTION

In all activities, whether they involve play or work, a certain amount of planning is necessary. Sound planning must efficiently maximize resources, time, and conduct of circumstances and significant concerns ahead. A vacation must be planned to save up expenses for food and trips. Gardening and landscaping that someone may have around the house; the repairs to be done or the things to be built and the like require thorough and careful planning. Planning is essential. It may come in the form of a concept or literally a piece of sketch, or perhaps a well-detailed drawing. If someone is learned enough about technical drawing or drafting, it will help draft a plan more wisely. Technical Drawing (TD) is a Strengthened Technical-Vocational Education Program (STVEP) under the K-12 Educational Program of the Department of Education. It is a requirement for Grades 7 and 8 students under Technical- Vocational Education courses.

This training guide blends with the K-12 technical drawing modules to enhance students' knowledge, desirable work attitudes, and skills. It covers the core competencies of Technical Drawing such as mensuration, freehand drawing, lettering, construct geometrical figures, orthographic projection, and construct pictorial drawing. Grade 7 students shall take up first the mensuration competency, which allows them to understand the Systems of Measurement and its practicality. They must acquire the necessary measuring skills to work on the rest of the competencies. Consequently, Grade 8 students will be dealing with the last two competencies, such as orthographic projection and the construct of pictorial drawing. This completes their learning experience in Technical Drawing 1 and 2. Technical drawing gives the fundamental principles of the language of the industry in the acquisition of technical knowledge and skills among students of trade courses which can be used in their personal and professional pursuits. Technical- Vocational Education areas mostly require drawing competency of students further to understand the concept of planning and output generation. Technical knowledge, skills and the right study attitude can be meaningfully acquired through actual step-by-step experiential learning, (Clark & White 2010). However, any intention at maintaining and improving any attempt of program delivery needs a training guide. (Arthur,W. et. al. 2003) emphasizes the efficiency of training using an appropriate method and

training program. The mode of conduct is easily managed and evaluated; thus, a training guide provides a clear direction to the attainments of the objectives of the program. This is true with the Technical Education and Skills Development Authority (TESDA). Each course they offer has a Training Regulation that serves as a guide for trainers in conducting such training and in evaluating trainees' performance according to the unique set of expected competencies of the course. The training guide explicates several training models or methodologies that can be adapted in the training itself. It also expedites the ways and means on of establishing the relationship between theories and application, ideal practices and their effects, supervision, assessment and evaluation. It also clarifies training needs such as the facilities, tools and equipment and their possible upgrading. Likewise, the training guide serves as a guidelines in maintaining standards required by the industry. Thus, the trainee's knowledge and skills align with the industry practices (Kozlowski, S. 2000). Dr. Charles A. Prosser, who postulated the importance of Repetitive Training which is the sixth theory of vocational education, stated that "Vocational education will be effective in proportion to the specific training experience in forming the right habits of doing and thinking that are repeated to the point that these habits become fixed to the degree necessary for gainful employment." It must be stressed out that the fundamental theory of Vocational Education is a habit psychology. The set of habits as outcomes of repetitive experience may not be of use unless it is turned into a form of skill. In fact, the more repetitions made on the job or operation, the more efficient is the production carried out. Thus, drawing is a necessary and requirement skill for Technical Vocational Education trade courses. The learning provider or the teacher must consider the use of modules and a training guide for teaching and for assessment effectivity to further improve instruction.

II. GENERAL OBJECTIVES

Through the given instruction, demonstration, and thorough guidance, the students shall be able to:

1. Harness the power of visualization and keen observation;
2. Strengthen constructive imagination;
3. Enhance analytical and critical skills;
4. Hone accuracy of thought and expression;
5. Advance writing and reading skills towards the Language of Industry;
6. Develop the habits of neatness, orderliness, accuracy, cleanliness, speed, creativity and resourcefulness;
7. Maintains the practice of good workmanship and design;
8. Interpret working drawing and specifications in relation to Technical Drawing;
9. Sharpen the ability to apply the art and drawing principles; and techniques in one's work, in school, in industry, at home and in everyday life; and
10. Appreciate Technical Drawing as a subject and all its undertakings.

Time Duration: 200 Hours

Description: This Course Is Designed To Enhance The Knowledge, Desirable Attitudes, And Skills Of Students. It Covers Core Competencies Such Freehand Drawing, Lettering, Mensuration, Constructing Geometrical Figures, Orthographic Projection and Construct Pictorial Drawing

COMPETENCY	UNITS OF COMPETENCY	NO. OF HOURS
Mensuration Grade 7	1. Measure Object/Distance In millimeter 2. Measure Object/Distance In centimeter 3. Measure Object Distance In Inch 4. Write Measurement On Drawing 5. Secure Required Measuring Tool (Ruler)	20 Hours/Meetings
Freehand Drawing Grade 7	1. Draw Short And Long Horizontal Lines 2. Draw Short And Long Vertical Lines 3. Draw Short And Long Incline Lines	20 Hours/Meetings

	4. Draw Short And Long Perpendicular Lines 5. Draw Short And Long Parallel Lines 6. Draw Arcs And Circles 7. Draw Borderline 8. Draw Objects In Outline Form 9. Sharpen Pencil 10. Erase Pencil Lines	
Lettering Grade 7	1. Draw Guidelines 2. Print Lowercase Single-Stroke Gothic Letters 3. Print Uppercase Single- Stroke Gothic Letters 4. Print Single-Stroke Gothic Numbers and ampersand 5. Print Words In Single-Stroke Gothic Letters 6. Print Paragraphs In Sing-Stroke Gothic Letters 7. Center Title Using "Trial-And-Error Method" 8. Center Title Using "Scratch-Paper Method" 9. Maintain Inter Letter Spacing 10. Maintain Inter Word Spacing	20 Hours/Meetings
Construct Geometrical Figures Grade 7	1. Bisect Horizontal And Vertical Lines 2. Bisect Arcs 3. Bisect Common Angles 4. Draw Equilateral Triangle 5. Draw Square 6. Draw Pentagon 7. Draw Hexagon 8. Draw Heptagon 9. Draw Octagon 10. Draw Nonagon 11. Draw Decagon 12. Draw Ellipse 13. Manipulate Compass 14. Manipulate Protractor 15. Manipulate 30x60 And 45x45 Triangles	30 Hours/Meetings
Orthographic Projection Grade 8	1. Sketch Alphabet Of Lines 2. Block-In Views 3. Draw Orthographic Views Of The Object With Horizontal and Vertical Surfaces 4. Draw Orthographic Views Of Object With Inclined Surfaces	50 Hours/ Meetings

	5. Draw Orthographic Views Of Object With Regular Curved Surfaces. 6. Draw Orthographic Views From The Given Pictorial View 7.Draw A Detailed Working Sketch 8. Sketch An Assembly Working Drawing 9. Write Measurement On Top, Front, And Side Views Of An Object 10. Manipulate Pencil And 45x45 Triangle	
Construct Pictorial Drawing Grade 8	1. Draw Isometric Axes 2. Draw Isometric Views Of Objects With Horizontal And Vertical Surfaces 3 Draw Isometric Views Of Object With Incline Surfaces. 4. Draw Isometric Views Of Objects With Regular Curved Surfaces 5.Draw Isometric View From The Given Orthographic Views 6. Draw Cavalier And Cabinet Axes 7. Draw Cavalier Pictorial Views 8. Draw Cabinet Pictorial Views 9. Draw Parallel Perspective. 10.Draw Angular Perspective	50 Hours/ Meetings

- Teaching Methodologies:

1. Mastery learning
2. Illustrative Demonstration
3. Lecture/discussion
4. Research, others

- Assessment methods:

A. Written (Summative / Periodical) test
B. Plate-making
C. Performance / Practical test

- Facilities/Equipment, tools and materials

A. Drawing table - 18”x20”x34”
B. Drawing stool
C. Ruler
D. Sharpener
E. Triangles (30x60, 45x45) – 10 inches
F. T-square – 24 inches
G. Compass
H. Protractor
I. Pencil (ordinary / mechanical)
J. Soft White Eraser
K. Masking Tape
L. Oslo paper -9”x12”

- Learning resource materials:

A. Illustrated charts
B. Drafting books
C. Other related references
D. Printed materials

Station: Naga National High School
Subject: Technical Drawing 1
Competency: Mensuration

A. Unit Title: Measuring
B. Learning Objectives: Through A Given Illustrative Discussion, The Students, Shall Be Able to; A. Define Measuring; B. Identify the 2 Systems of Measurement; D. State the Importance of Measurement; &

E. Practice Measuring Using Ruler.

Learning Content	Procedure	Activity	Methods	Resources	Time
Define Measurement Guide Questions: What Is Measurement? Why Is There a Need for Measurement? Relate the ff. Time Resources/ Money Materials Effort	Illustrative Demonstration of the ff: Characters On the Ruler Number Calibrations Units Of Measurement Systems Of Measurement A. Metric B. English	Metric Linear Measurement Measuring in Millimeter Good Workmanship	Individualize Instruction If Necessary Encourage Responsible Usage of Ruler Inductive Discovery Application	Illustrated charts Photocopy Of Linear Measuring Activity	5 hours/ or 5 meetings

C. Scoring Rubrics

ACCURACY
50 - output exactly done.
45 - manifestation of 3 to 5 mistakes.
40 - manifestation of 6 to 10 mistakes.

SPEED
10 - output submitted before deadline.
8 - output submitted on deadline.
5 - output submitted after deadline.

NEATNESS
25 - manifestation of dirty erasures on output not evident.
20 - manifestation of 3 to 5 dirty erasures on output.
15 - manifestation of 6 or more dirty erasures on output.

LABELING
15 - uniformity in lettering, proper spacing, and completeness of information on output manifested.
10 - uniformity in lettering, proper spacing, and completeness of information are not manifested.

Station : Naga National High School
Subject : Technical Drawing 1
Competency : Freehand Drawing

A. Unit Title: Title Block Making (Plotting Of Lines)					
B. Learning Objectives: Through a given illustrative discussion, the students, shall be able to; A. Define line; B. Know the different types of line; C. Understand the purpose of each line as component in the title block; D. Plot correctly the lines on the drawing paper; & E. Apply the proper technique of measuring.					
Learning content	Procedure	Activity	Methods	Resources	Time
Title block-making (plotting of lines) Types of line Horizontal line Vertical lines Incline lines Purpose of line in title block as: Border line Visible line. Guide line Line projection technique Dot method Center to center method	Discuss & illustrate the following:: A. Definition of line B. Types of line C. Application of the types of line to title block-making using it as : Border line Visible line Guide line Define and illustrate the function of each in the title block. Integrate the techniques of line projection such as: Dot method Center to center method	Defining Brainstorming Question-and answer Drawing Measuring Good Workmanship	Discussion Demonstration Discovery Application	Illustrated charts Power point presentation	5 hours/ or 5 meetings

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Station : Naga National High School
Subject : Technical Drawing 1
Competency : Lettering

A. Unit Title: Single-stroke gothic uppercase lettering (Deped mission)

B. Learning Objectives:
Through a given illustrative discussion, the students, shall be able to;
A. Review the techniques in plotting measurement;
B. Show the correct projection of visible lines and guide lines; &
C. Describe single-stroke gothic letters
D. Apply proper lettering for DepEd mission.

Learning content	Procedure	Activity	Methods	Resources	Time
A. Lettering "Deped mission" Or "City of Naga Hymn"	A. Show the content of the activity to the students B. Illustrate the relative measurement for: 1. Distances 2. Line of letters 3. Lettering space	Perform Measuring Lettering Visualizing Good Workmanship	Discussion Demonstration Discovery Application	Illustrated charts Power point presentation	5 hours/ or 5 meetings

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Station : Naga National High School
Subject : Technical Drawing 1
Competency : Construct Geometrical Figures

A. Unit Title: Drawing Geometrical Figures

B. Learning Objectives:

Through a given illustrative discussion, the students shall be able to:
A. Interpret specification given according to the required measurement;
B. Manipulate compass and other drawing instruments properly;
C. Bisect line, arc and angle and draw parallelograms and regular polygons; &
D. Present a neat and accurate drawing output.

Learning Content	Procedure	Activity	Methods	Resources	Time
Geometric Figures a. Bisect line b. Bisect Arc c. Bisect angle d. Draw equilateral triangle e. Draw parallelograms 1. inscribe and circumscribe squared 2. Draw pentagon	Part 1 Discuss the usage of compass in the process of bisecting Explain specific measure of geometric figures Part 2 A. Bisect Line Discuss the steps in	Upgrade skills in measuring Upgrade skills in using measuring instruments Upgrade freehand and lettering skills Practice using compass Good Workmanship	Illustrative discussion Demonstration Inductive Application	Illustrated charts Power point presentation	5 hours/ or 5 meetings

3. Draw hexagon 4. Draw heptagon 5. Draw octagon 6. Draw nonagon 7. Draw decagon 8. Draw ellipse	bisecting line B. Bisect Arc Discuss the steps in bisecting arc C. Bisect Angle Discuss the steps in bisecting angle D. Discuss the steps in drawing regular polygons				

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Station : Naga National High School
Subject : Technical Drawing 2
Competency : Orthographic Projection

A. Unit Title: Orthographic Drawing
B. Learning Objectives: Through a given illustrative discussion, the students shall be able to: A. Define orthographic drawing;

B. Name the three fundamental views of orthographic drawing;
C. Draw orthographic project from a simple pictorial drawing;&
D. Present a neat and accurate drawing output.

Learning Content	Procedure	Activity	Methods	Resources	Time
Orthographic Views a. Top View b. Front view c. Side View d. Projection lines e. Block-in views f. 45x45 triangle	Discussion on the definition of: Orthographic drawing and its views Relationship of the three views Analyze simple isomeric view and construct into orthographic drawing Emphasize appropriate techniques and the use of 45x45 triangle Question-and answer, and processing	Perform Analytical skills Perform Measuring Enhance drawing skills Good Workmanship	Illustrative discussion Discovery Application Deductive Discovery Good Workmanship	Illustrated charts Power point presentation	5 hours/ or 5 meetings

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15 - manifestation of 6 or more dirty erasures on the output.

LABELING

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Station : Naga National High School
Subject : Technical Drawing 2
Competency : Construct Pictorial Drawing

A. Unit Title:					
B. Learning Objectives: Through a given illustrative discussion, the students shall be able to: A. Define isometric view; B. Differentiate isometric view from orthographic drawing; C. Draw isometric view from a simple orthographic drawing;& D. Present a neat and accurate drawing output.					
Learning Content	Procedure	Activity	Methods	Resources	Time
Isometric view Left-cross axis Right-cross axis Vertical axis Isometric box 30x60 triangle	Part 1 Brief recall on orthographic drawing Let students differentiate orthographic drawing from isometric view Part 2 Discuss the ff. Isometric view and its axes Isometric box Synthesizing orthographic drawing to isometric view Steps and techniques and the use of 30x60 triangle Question-and-answer	Synthesizing concepts of orthographic to isometric Perform Measuring Enhance drawing skills Good Workmanship	Illustrative discussion Demonstration	Illustrated charts Power point presentation	5 hours/ or 5 meetings

	and processing				

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CONCLUSION

Teachers must keep constantly update themselves to the latest trends and standards in instructional methodologies and paraphernalia in Technical Drawing. The season has changed so as the students. This reality sometimes enticed people to make a spontaneous comparison of interest, perception and performance, and even attitude of today's youth to the kind of students 5 to 10 years ago or more. Of course this declaration is subjective in nature. Not all people have the same impression on what they observe. Objectively, the generation of today's youth is most likely challenged not only by the continued academic innovations but by a lot of distractions through social media, computer games, family issues, personal matters and the like. They usually make choices that brings them gratification and satisfaction that can simply cause certain impacts on their studies . Thus, the teachers must be equipped with the skills with a heart on how to handle peculiarities among students. The classroom must be an exciting venue for students learning new things. Where students and teachers collaborate in achieving their goals. Entry requirements for applicants who wish to enroll in STVEP curriculum such as teacher interview and written examination must be reinforced to determine fitness of students in the chosen curriculum, I.Q., level of interest, awareness of "learning by doing", and future goals they might achieve after acquiring the necessary technical knowledge, skills and right attitude included in the curriculum. By this scheme, teachers assigned to teach Technical Drawing may have the confidence to deliver and impart the competencies, As such, the scope and output of this study is in the form of Training guide for the subject must be utilized as supplemental to available modules. since Technical Drawing is an integral part of the program. The output is seen to loosen the constraint or difficulty of lesson preparation and delivery, inclusion of appropriate activities, competencies, and assessment to students. It will serve as blueprint of the subject among teachers; helping them attain desired competence and confidence. Teachers must also involve themselves in research activities to further enhance their acquired professional skills and periodically benchmark with other institutions to acquire more insights on instructional innovation in Technical Drawing and facility improvement.

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