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## **TECHNICAL DRAFTING MODULE FOR GRADE-8 STUDENTS BASED ON THE EVALUATION RUBRICS OF LEARNING RESOURCES MANAGEMENT AND DEVELOPMENT SYSTEM**

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### **ABSTRACT**

This study presents the step-by-step development of module in Grade-8 Technical Drafting following the distinct phases used in the development of learning materials. Modular instruction as an aid to individualize learning by allowing learners to achieve mastery of one unit of content before considering a new lesson help them catch up with missed lessons. Its advantages provide authentic experiences, independence, mastery of concepts and better study on learning skills in drafting. Development of the said module took place from careful consideration of a model known to be effective beginning with analysis, design, development, and evaluation which eventually led to the used of an adopted evaluation form from LRMS of Department of Education for Printed Resources and Materials. In this study, Technology and Livelihood Education experts took the role of being the evaluators of this said developed module and findings revealed that among the seven (7) statements, experts in TLE evaluated the modules' content, format, presentation and organization, and up-to-datedness of information. Hence it is recommended that the module be used in similar contexts particularly in learning basic technical drafting skills. As quantitative method of research has been used to this study, this research employed strategies of inquiry that involved collecting data to best understand the research problem prioritizing topic(s) in drafting that needs the aid of assessing and evaluating a module in the teaching of drawing principles. Data collection involved gathering of numeric information so that the final database represented quantitative information (Creswell, 2014) On the basis of findings, a total mean of 3.91 was computed for the over-all criteria of the developed instructional module, with a descriptive interpretation of Very Satisfactory (VS) that was based on the instrument tool provided by the LRMS on Printed-Materials of the Department of Education, has provided essential information that a well develop module could mean lot of importance, enhancement, and encouragement for providing ease, comfort, and effective way of dealing and delivery of lessons that the curriculum on TLE

has designed for the learners. The findings of the study brought about the implication for strengthening both the theory and practice in regard to devising modules in technical drafting as aid in classroom instruction. Specifically, the researcher has hopes that redirecting the focus to what the students can do, using the developed module for instruction, can then provide quality drafting students in Grade-8 and encouraged them to accept more responsibility for their learning with respect to an acceptable level of confidence and self-motivation. In the light of the outcomes as evaluated developed module in Technical Drafting by the Learning Resources Management and Development (LRMDS) of the Department of Education of the Division of Bulacan and the respondents of this research, succeeding conclusions are drawn. Developed module in Grade-8 Technical Drafting presented curiosity and build motivational approaches in learning the basic skills in drafting. Content, format, presentation and organization, and accuracy and up-to-datedness provided the material a logical, sequential order as specified by the developer. It was designed to be engaging and informative. As highly recommended printed material designed for future implementation and adoption in different technology-based schools in Bulacan the developer was encouraged to continue sharing and presenting the developed module for further assessment, evaluation, and validation prior to its division-wide implementation in the coming school years.

**KEYWORDS** – Module Development in Technical Drafting, Students, Teachers, Curriculum Planner, Printed Modules, Printed Modules

## **INTRODUCTION**

Technical Drafting skills as prerequisite learning techniques in preparatory architectural and engineering courses were dispensed from generation to generation. It brought the past years of design and construction as a broad spectrum of human existence of representing graphic language, diagrams, layouts and dimensions brands us artistically as skilled human beings. The study of drafting serves as greater challenge for the demands of the industries nowadays and the invitation it is extending to the Filipino youth as drafting students, need to be more creative and innovative in many ways.

Reinforcement of the new learning exercises and problems create concrete examples on how teachers of the drafting courses particularly in Grade-8 should participate in the design and

revision of the learning module. The researcher as a module developer selected the most basic learning model in drafting that has led into the mastery of knowledge and skills. Technical terms, techniques and appropriate approaches were used in the development of the module in Drafting which was adequately designed for learning instruction and was made attainable and enjoyable for the use of students.

With the increasing demand of the Department of Education (DepEd) to provide localized learning modules to further cater the needs of students in the “new normal” education setting, teachers were necessitated to develop Instructional Materials (IMs), especially to drafting teachers. While teaching might be a joy and gratifying it does not mean it is “problem-free.” The great amount of planning, arriving at solution and stress debriefing activities made implementers relieved from the burden brought by the pandemic in the education system. Online teaching platform certainly need back-ups for more effective and reliable source of information, skill-mastery and competitive educational structure.

Educational institutions are doing their best effort to deal with the prevalent challenges brought about by Covid-19. From previous years to present, millions of graduates who earned degrees and vocational skills piled up and keep themselves holding onto finding their dream jobs and all things of not losing their hopes to get into one suitable job for them.

In addition to this, establishment of the Department of Education (DepEd) through the Education Decree of 1863, as the Superior Commission of Primary Instruction under a Chairman, underwent many reorganization efforts in the 20<sup>th</sup> century and that includes our Department of Education that was mandated through Republic Act 9155 popularly called as the Governance of Basic Education Act of 2001, which establishes the mandates of this agency. Taking under consideration all elementary and educational agencies, additionally to incorporate different learning systems, both public and private thereby give the institution and maintenance of an entire, adequate, and integrated system of basic education relevant to the goals of national development (DepEd, 2019). As all these facts proves serious responses to grounding the right character-building that every Filipino needs to present to the world, teachers were therefore expected to perform on their highest capacities.

Moreover, DepEd Order no. 31 s. 2012, known as the K to 12 Curriculum has been implemented for high school. This program aims to focus not only on the academic field of the learners but also the technical and livelihood skills that they should have. This is the reason why modules for exploratory courses should be developed to further enhance the technical skills and academic standards of the students. Supporting these objectives requires talented and dedicated teachers to fill gaps in the course of teaching and integration of skill-based learning system.

The aim of the Department of Education is to develop socially valuable talents that can contribute to building a peaceful progressive society, whose students are directed to become respected and valued participants in the global community ensuring world-class and excellence in ability.

In response to the problems at hand, guided by the implementing rules and regulation of RA 9155, DepEd Order 76, s. 2011 known as National Adoption and Implementation of the Learning Resources Management and Development System (LRMDS), a web-based catalogue and online repository of learning, teaching and professional development resources was made possible for all DepEd teachers to contribute their abilities to create, design, upload and download learning materials for their use in teaching their subjects with ease and convenience.

Likewise, in support to the K to 12 Basic Education Curriculum, Department of Education ordered to disseminate DepEd Order 67, s. 2012 known as Guidelines on the Implementation of Strengthened Technical-Vocational Education Program (STVEP) and Technology and Livelihood Education (TLE Curriculum) has made to augment the vocational capabilities of today's youth in terms of acquiring skill-based mastery and other technical skills. Anchored with providing technical skills development in any area of specialization with the following five (5) common competencies including (1) mensuration and calculation, (2) technical drafting, (3) use of tools and equipment, (4) maintenance of tools and lastly (5) occupational health and safety for the exploratory phase. Teachers who are into this task are required to be National Certificate (NC) holders (STVEP in the Philippines, 2012).

The public health emergency brought about by the pandemic (COVID-19) calls for the Department of Education (DepEd) to be innovative and resourceful in delivering quality, accessible, relevant, and liberating education. In response to this emergency, DepEd developed the Basic Education Learning Continuity Plan (BE-LCP) to ensure that learning opportunities are provided to our learners in a safe manner, through different learning delivery (DepEd Order No.018, s.2020). Teachers were, likewise, encouraged to play a vital role in devising self-contained, self-instructional, self-faced and interactive learning resources known as Alternative Delivery Modules or Self-Learning Modules (SLMs).

Instructional materials enhanced the teaching and learning process by exhibiting information necessary to acquire knowledge and skills. Students trained with basic vocational knowledge, skills, and attitudes to facilitate occupational efficiency requires skill-oriented teaching and learning activities. Over the years the poor performance of students in public examinations has been blamed on the wrong choice of teaching methods of teachers. Teaching and learning activities have a lot to do with variables such as school environment, student factors and lastly instructional materials.

Drafting as one of the most challenging subjects to majority of vocational and technical schools, has anticipated the future of designing into creating more innovative structures, products and pictorial representations acquired through training not only the hands but also the eyes and the minds of students. As this subject of specialization offers the importance of drafting, planning and conceptualization, it also motivates the creative attributes of students whose interest is in turning ideas into penciled and pen drawings. To meet the Technology and Livelihood Education (TLE) requirements, every learning resource and material should be aligned to the competencies presented for technical drafting program.

This study also presents relevant search findings related to development of modules, especially learning materials in Grade-8 Technical Drafting. The developed module in this study is subjected to the evaluation of selected drafting teachers and the assessment of LRMDs coordinators of the Department of Education (Guidelines and Process for LRMDs Assessment and Evaluation, 2009). Grounded on the aforementioned concerns, the researcher as an educator, strongly believed the effectiveness and positive aid of developing a module for the use of drafting teachers in many vocational schools. As it was designed to help the drafting teachers save more of their time planning and preparing for drafting lessons with activities carefully arranged from basic to complex approach of solving drawing problems. The result of the study will be used as basis in planning and designing further modules related to other Technical-Vocational courses in order to produce not only skilled, but also globally competitive learners.

## **METHODOLOGY**

This research used quantitative method that employ strategies of inquiry that involved the collection of data to best understand the research problem prioritizing topic(s) in Drafting that needs the aid of assessing and evaluating a module in the teaching of drawing principles. Data collection involved gathering of quantitative information so that the final database will represent quantitative information (Creswell, 2014).

Researcher gathered information and considered competencies needed by students in the development of an instructional module in Technical Drafting. Lessons included in the instructional module are based on the curriculum checklist made and provided by the Technology and Livelihood Education of the Department of Education (DepEd). A standardized research instrument from LRMDs was used as a tool for the evaluation of the developed

module, distributed to selected practitioners in the field from different institutions. For the respondents of this study who evaluated the instructional module, the researcher considered the different schools in the Division of Bulacan, that are offering Technical Drafting.

**Table 1.**

*Result of the Evaluation of the Developed Instructional Module in Terms of the Content*

Items	Responses				Mean	Descriptive Interpretation
	4	3	2	1		
<b>Factor A. Content</b>						
1. Content is suitable to the student's level of development.	18	1	1	0	3.85	Very Satisfactory
2. Material contributes to the achievement of specific objectives.	18	2	0	0	3.90	Very Satisfactory
3. Materials provides for the development of higher cognitive skills.	20	0	0	0	4.00	Very Satisfactory
4. Material is free of ideological, cultural, gender biases and prejudices.	16	3	1	0	3.75	Very Satisfactory
5. Material enhances the the development of desirable values and traits.	15	5	0	0	3.75	Very Satisfactory
6. Materials has potential To arouse interest.	15	4	1	0	3.70	Very Satisfactory
7. Adequate warning and cautionary notes are provided.	14	6	0	0	3.70	Very Satisfactory
<b>Total Mean</b>					3.80	Very Satisfactory

Table 2.

*Result of the Evaluation of the Developed Instructional Module in Terms of the Format*

Items	Responses				Mean	Descriptive Interpretation
	4	3	2	1		
<b>Factor B. Format</b>						
1. Size of letters is appropriate.	19	1	0	0	3.95	Very Satisfactory
2. Space between letters and words facilitate reading.	18	2	0	0	3.90	Very Satisfactory
3. Font is easy to read.	19	1	0	0	3.95	Very Satisfactory
4. Printing is of good quality.	20	0	0	0	4.00	Very Satisfactory
<b>Illustrations</b>						
1. Simple and easily recognizable.	18	2	0	0	3.90	Very Satisfactory
2. Clarify and supplement the text.	19	1	0	0	3.95	Very Satisfactory
3. Properly labeled or captioned.	18	2	0	0	3.90	Very Satisfactory
4. Realistic/appropriate.	20	0	0	0	4.00	Very Satisfactory
5. Attractive and appealing.	20	0	0	0	4.00	Very Satisfactory
<b>Design and Layout</b>						
1. Attractive and pleasing to look at.	20	0	0	0	4.00	Very Satisfactory
2. Simple	18	2	0	0	3.90	Very satisfactory
3. Adequate illustration in relation to text.	20	0	0	0	4.00	Very Satisfactory
4. Harmonious blending of elements.	20	0	0	0	4.00	Very Satisfactory
<b>Paper and Bonding</b>						
1. Paper used contribute to easy reading.	20	0	0	0	4.00	Very Satisfactory
2. Durable binding to withstand frequent use.	18	2	0	0	3.90	Very satisfactory
<b>Size and Weight Resource</b>						
1. Easy to handle.	20	0	0	0	4.00	Very Satisfactory
2. Relatively lightweight.	19	1	0	0	3.95	Very Satisfactory
Total Mean					3.95	Very satisfactory

Table 3.

*Result of the Evaluation of the Developed Instructional Module in Terms of Presentation and Organization*

Items	Responses				Mean	Descriptive Interpretation
	4	3	2	1		
<b>Factor C. Presentation and Organization</b>						
1. Presentation is engaging	20	0	0	0	4.00	Very Satisfactory
2. Logical and smooth flow of ideas.	19	1	0	0	3.95	Very Satisfactory
3. Vocabulary level is adapted to learner's experience.	20	0	0	0	3.95	Very Satisfactory
4. Length of sentences is suited to the comprehension level of the learner.	20	0	0	0	4.00	Very Satisfactory
5. Sentences and paragraph structures are varied and interesting.	19	1	0	0	3.95	Very Satisfactory
Total Mean					3.97	Very Satisfactory

Table 4.

*Result of the Evaluation of the Developed Instructional Module in Terms of Accuracy and Up-to-datedness*

Items	Responses				Mean	Descriptive Interpretation
	4	3	2	1		
<b>Factor D. Accuracy and Up-to-datedness</b>						
1. Conceptual errors.	20	0	0	0	4.00	Very Satisfactory
2. Factual errors.	19	0	0	0	3.95	Very Satisfactory
3. Grammatical errors	18	2	0	0	3.90	Very Satisfactory
4. Compound errors	18	2	0	0	3.90	Very Satisfactory
5. Obsolete errors.	18	2	0	0	3.90	Very Satisfactory
Total Mean					3.93	Very Satisfactory

Therefore, a *total mean* of 3.91 was computed for the over-all *criteria* of the developed instructional module, with a descriptive interpretation of *Very Satisfactory* (VS) that was based on the instrument tool provided by the LRMS on Printed-Materials.

## RESULTS AND DISCUSSION

### 1. How do teachers deliver the lessons and facilitate activities in technical drafting and what are the competencies required to meet by the technical drafting students?

Drafting teachers traditionally deliver lessons in Grade 8 with so much care and concern on motivating students to perhaps be interested in the subject at the earliest stage of learning using the traditional drawing instruments. As it is not just an ordinary lesson on numbers, drawings, and constructions, drafting requires perseverance, devotion, and lots of patience to appreciate and master the skills it offers. Likewise, knowledge of the important use of the principle of instruction in the delivery of the subject can aid in teaching technical drafting effortlessly. As the principle of instruction offers five (5) principles that have been identified to promote learning includes: 1) learners should be engaged in solving real-world problems, 2) existing knowledge should be activated as a foundation for new knowledge, 3) new knowledge should be demonstrated to the learner, 4) new knowledge should also be applied by the learner, and 5) new knowledge must be integrated into the learner's world.

Because the subject needs many visualizations and graphic representations, relevant competencies must also be learned, mastered, and acquired through scheduled practice and performances.

These competencies were categorized into three sets: Basic Competency, Common Competency, and Core Competency.

**Basic competencies are as follows:** 1) Drafting students need to understand the use of the different tools in drafting. 2) Likewise, they need to appreciate the concept of mensuration. 3) Students should be able to describe the size and shape of any given object for construction. 4) It also matters to be aware of the opportunities that exist in the field of drafting.

**The common competencies include:** 1) Students should be able to use basic manual tools traditionally used in drafting. 2) They should also be capable of manually sketching drawings of manufactured forms. 3) And lastly, the capability to create drawings of basic objects.

**The core competencies include the following skills:** 1) It is very much expected that students maintain high standards of quality drawings. 2) Use and understand the terminology related to drafting. 3) And to be able to produce drawings for future projects in drafting.

## **2. How may a module in technical drafting be designed and developed using analysis, design, development, and evaluation?**

The primary objective of developing the module is to help lessen the challenging and intricate tasks of facilitating lessons to students. It was developed with greater emphasis on the problem-centered type of instruction and involving students in the real-world task of the subject. Assured to provide relevant problems, making each lesson interesting and engaging therefore should also provide problems from less complex to more complex ones.

## **3. How do practitioners in TLE drafting evaluate the module?**

Evaluation of the developed module promotes learning and is thus necessary after the module was developed. Experts in TLE- Technical Drafting evaluated the said module using the LRMDS Evaluation Form of the Department of Education. On a given specific time frame, each evaluator was provided with a copy of the developed module together with the evaluation form adopted from the LRMDS for Printed resources. As module evaluation refers to the formal and informal process of collecting feedback from experts in regards with relevance, effectiveness, and efficiency of the module, the researcher's main target was only to gain first-hand information on the relevant feedback to underpin changes to the developed module which the researcher hopes could further enhance the beneficiaries' experience. Redesigning the module due to possible negative feedback was foremost expected but was never materialized after a considerable positive experience was provided by the evaluators.

## **4. How may the developed module be evaluated based on the following criteria set by the LRMDS of the Department of Education?**

The evaluation form for Print resources was used as the primary tool in assessing the developed instructional module.

The evaluation form is composed of four factors: (1) content, (2) format, (3) presentation and organization, and (4) accuracy and up-to-datedness of information.

**Content.** The *content* of the instructional module was evaluated by the experts in Technology and Livelihood Education (TLE). It was interpreted as *very satisfactory* which means that the lessons and activities included in the module can help the students in learning technical drafting with ease and confidence.

**Format.** The *format* of the developed module was evaluated by the experts and was interpreted as *very satisfactory*. This shows that the format of the module fits exactly with the expectations, demands, and design of the curriculum where modules should be based on and fully grounded.

**Presentation and organization.** The *presentation and organization* of the instructional module were interpreted as *very satisfactory*. This proves that the presentation and organization of the module are suited to the levels of the target students, thus effective learning outcomes will follow.

**Accuracy and up-to-datedness of information.** An interpretation of *very satisfactory* was rated to the accuracy and up-to-datedness of information of the instructional module which means that majority of the information contained herewith is considered accurate and up to date.

## CONCLUSIONS/RECOMMENDATIONS

In the light of the outcomes as evaluated developed module in Technical Drafting by the Learning Resources Management and Development (LRMDS) of the Department of Education of the Division of Bulacan and the respondents of this research, succeeding conclusions are drawn. Developed module in Grade-8 Technical Drafting presented curiosity and build motivational approaches in learning the basic skills in drafting. It was designed to be engaging, informative, and conformed to the Technology and Livelihood Education skill requirements. Basic, common, and core competencies were considered the backbone of the delivery of lessons. Likewise, the principle of instruction was also emphasized. The technical drafting module was developed using analysis, design, development, and evaluation. Technology and Livelihood module writers and experts evaluated the printed instructional material. The evaluators made use of the

criteria provided by the Learning Resource Management and Development System of DepEd for Printed Materials. Content, format, presentation and organization, and accuracy and up-to-datedness provided the material in a logical, sequential order as specified by the developer. As highly recommended printed material designed for future implementation and adoption in different technology-based schools in Bulacan the developer was encouraged to continue sharing and presenting the developed module for further implementation, assessment, evaluation, and validation before its division-wide implementation in the coming school years. The developed module in technical drafting answered the invitation of the educational institution to provide learning techniques in basic drafting that were both beneficial to the teacher and the learner which rely on the use of modules. Designed to consider the individual differences among the learners to accommodate their self-paced ability and acquire ideas depending on their level of preparedness most appropriately help learners grow and develop on their own. The researcher had provided guarantee and support that the developed module in Grade-8 Technical Drafting would serve as a relief and as an onset to develop knowledge, skills, and values and its use and application would help promote greater achievements to the individual learner. Recommendations were made.

1. While this study is the first step, it is important to continue investigating research related to defining modular learning, examining effective organizational change, and exploring connections between modular learning and technical drafting which would be worthwhile endeavors. The next step would be to examine how effective is the developed module in Technical Drafting compared to the use of other existing modules provided by the Department of Education.
2. Involve students in the design and refinement of evaluation tools, questions, and processes, to enhance relevance and response rates. It is best to develop a module and design it in accordance with the expectation of the students on the subject rather than considering the expectation of the teacher, thus making the designed module more acceptable and engaging on the part of the learners who will be spending their time and effort dealing with the tasks presented in the module.
3. The information provided through module evaluation should be summarized and reflected upon in case the feedback fell mostly on negative experiences.
4. The instructional material developed by the researcher be utilized for instruction purposes.

5. Subject-developed module for ground testing to get more of its level of efficiency and usefulness from target learners.
6. Teachers are encouraged to write instructional materials and continue contributing to the knowledge of evaluation theories and practices.
7. Subject-developed module for availability online to aid teachers in their need for the use of it.
8. Developed module is recommended for adoption in Grade-8 Technical Drafting as reflected in the evaluation form of Dr. Joel I. Vassallo, Ph.D. /EPS-EPP/TLE/TVL of the DepEd Division Office of Bulacan.

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