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Effectiveness of K to 12 DepEd-Provided and Teacher-Made Modules on Student Performance in Technology and Livelihood Education Exploratory Subject Areas

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Abstract

Transition to K to 12 curriculum is one of the challenges in the Philippine educational system. Teachers and students are faced with problems that need adjustment. The study used a quasi-experiment design to explore the effectiveness of the modules made by the subject area teacher and the modules introduced by the Department of Education (DepEd) to enhance the K to 12 curriculum competencies, particularly in the Technology and Livelihood Education (TLE) subject area for Grade 7. The study revealed that both modules could be considered effective based on the computed mean scores from the pretest and post-test. Students' perceived level of satisfaction with the content, format, and instructions of both modules is "very satisfactory." Students find the teaching strategies and content mastery of the subject area teacher as "excellent." Based on the findings, any of the two modules may be used when teaching TLE for Grade 7 with some revisions and provision of more "high-tech" facilities to enhance the teaching and learning process further. Providing learning stations to practice the different skills learned in TLE is also recommended. Teachers must continuously update themselves by attending seminars, trainings and coming up with modules containing essential knowledge and skills needed by learners.

Introduction

Transition to K to 12 Curriculum is one of the greatest challenges or changes in the Philippine educational system. For example, the previously separate Home Economics and Industrial Education subject areas were merged in the K to 12 Curriculum. Hence, Home Economics teachers or instructors need to attend seminars and short courses that will equip them on Industrial Education subjects or areas. On the other hand, Practical Arts teachers or instructors need to up-date and equip themselves in related areas in Home Economics.

With these changes, teachers and students are faced with so many burdens and adjustments. Teachers must be updated and informed of the changes in our educational curriculum. In the past five years, the Department of Education (DepEd) conducted various K to12 trainings to Technology and Livelihood Education (TLE) teachers in line with the modules that DepEd experts created to

prepare the beginner and experienced teachers in vocational courses for the changes in the Philippine educational curriculum. Soft and hard copies of modules or teaching materials of the different technology and livelihood components were distributed during the training. The teaching materials focused on four main areas: 1) equipment, materials, tools, and their uses, 2) maintaining tools and equipment, 3) performing mensuration and calculation, and 4) practicing occupational health and safety. Technology and Livelihood Education teachers appreciated those constructed modules that would help them teach the students easier. But, still, they have met problems, like some parts in the module were found incorrect. To solve some problems encountered in some parts of the DepEd-provided modules, the researcher took the initiative to construct teacher-made modules that will respond to the needs of her students and tried to experiment if those teacher-made modules would be effective instructional resources for her students at the Philippine Normal University-Institute of Teaching and Learning (PNU-ITL).

This study tried to determine if the DepEd-provided modules and the teacher-made modules are effective resources for a successful teaching and learning process in TLE. It also determined the perceived level of satisfaction of the Grade 7 tudents on the different categories of teaching and learning process using the said modules: a) content and format of the modules, b) instruction, c) facilities (availability of tools and equipment), d) strategies of teaching, and e) teachers' mastery of the subject matter. Also, the study tried to discover the problems that the learners encountered during the entire school year, taking the four TLE areas they have chosen: dressmaking, commercial cooking, jewelry making, and nail care, using the DepEd- and Teacher-Made Modules as their reference and learning guide.

Teaching Resources and Teaching-Learning Process

This study was based on the concept that learning inside the classroom is achievable if tools or resources are available to make the teaching-learning process more effective. These resources can be in the form of intangible and tangible materials. Intangible resources in teaching are teachers' mastery of the subject area, knowledge and different skills related to the subject taught, teachers' variety of pedagogy or teaching styles and strategies. On the other hand, tangible materials in teaching comprise learning materials (like handouts, modules, textbooks), tools, and equipment in the laboratory rooms used during laboratory activities (Bolick et al., 2003).

Teaching resources include instructional materials that are commercially acquired or improvised by the teacher to make conceptual abstraction more concrete and practical to the learners (Shuaibu & Muhammad, 2018, as cited by Orakwue, 2000). Teachers utilize these relevant materials during the instructional process to make the content of instruction more practical and effective. Teaching resources are relevant materials utilized by the teacher during teaching to ensure the proper understanding and assimilation of the topic at hand by the use of form or illustration that seems desirable and depicts the real situation of the audience. The practical justification is that it is an instrument for accelerating the pace of all human transformation.

Teaching resources are important catalysts of social re-engineering and change in learners. Effective instruction cannot be well accomplished without using teaching resources. The use of advanced technology to aid in teaching brought a great change and social development that positively affects the classroom teaching-learning situation positively and successfully (Alvine, n.d.). Teaching resources as teaching aids are used to enhance teaching and learning. Teaching resources are integral components of teaching and learning situations. Teaching resources supplement learning and complement the teaching-learning process (Sudhakar, 2017).

Available teaching resources must be effectively utilized to have an effective teaching-learning activity because these resources provide teachers with compelling platforms for conveying information that helps motivate students to learn more and more to produce an intended good result (Phyllis 2011 as cited by Onditi, 2018). Teaching resources also assist teachers in overcoming physical difficulties that hinder them from effectively presenting a given topic. Generally, teaching resources make teaching and learning easier and less stressful. They are equally indispensable catalysts for change and the intellectual development of learners (Bolick et al., 2003).

In the Philippine K to 12 program, TLE is the subject that has the most number of components. For exploratory areas in Grade 7 and 8, TLE comprises several learning areas like nail care, dressmaking and tailoring, housekeeping, caregiving, bread and pastry, commercial, cooking, carpentry, handicrafts (jewelry making, paper crafts), and many others. In the analysis of the K to 12 Program in the Philippines by SEAMEO INNOTECH (2012), they mentioned that "students need to be competent in their skills in order to contribute to the society. The specialized competencies allow learners to meet the expectations and demands of work. Thus, will help students to be guided in whatever academic tracks they want to pursue in grades 11 and 12 or "Senior High School" (Magno, 2011).

At PNU, some of the facilities in the subjects of Commercial Cooking and Dressmaking are provided by the University and the Institute "Sangunian ng Mga Guro at Magulang," while parents provide tools, materials, and implements for Jewelry Making and Nail Care. Still, there are laboratory facilities that are still lacking, not available, or not enough for the entire class. The teaching strategies applied by the teachers to improve the teaching-learning process are lecture-discussion, dyad activity, individualized and group laboratory activities, actual teachers' follow-me demonstration, role-playing, sharing of experiences, and feedbacking after each lesson and laboratory activities. Mastery of the subject matter of the teacher is also considered to assure that students are really learning in the class.

Conceptual Framework

Figure 1 presents the study framework where the inputs to the study are the student profile, which includes their year and section, and the modules they use in every grading period. The processes considered in the assessment were the giving of pretest (before the lessons) and post-tests (after taking all the lessons and activities) in the TLE subject areas taken for the whole school year. Semi-structured descriptive questionnaires and interviews were facilitated to know the student perceptions in the different TLE areas taken. The outputs are the pretest and post-test results and the responses of students to the questionnaires given to them, considering the five components of effective teaching: (1) content and format of the modules, (2) instruction, (3) facilities, (4) strategies of teaching, and (5) teachers' mastery of the subject matter.

The teacher made modules are patterned on the DepEd made modules consisting of the four main areas: 1) equipment, materials, tools, and their uses, 2) maintaining tools and equipment, 3) performing mensuration and calculation, and 4) practicing occupational health and safety, but lessons are presented simpler and easy to understand on the part of the students.

Methodology

The study used a quasi-experimental research design involving two groups, the control (Dep-Ed module) and experimented group (Teacher-made module). The purpose is to check if both DepEd and teacher-made modules are effective tools in teaching and learning TLE areas based on the difference in pretest and post-test results from the treatments given to the two independent groups. DepEd modules were used by 7-Mapagbigay, and teacher-made modules were used by the 7-Matiyaga, except for jewelry making module because at the time this study was made, the available module included in the DepEd provided modules were paper crafts or gift-wrapping modules only. The study entailed observation, recording, and analysis of the cause-effect relationship comparing the two groups' achievement and satisfaction levels.

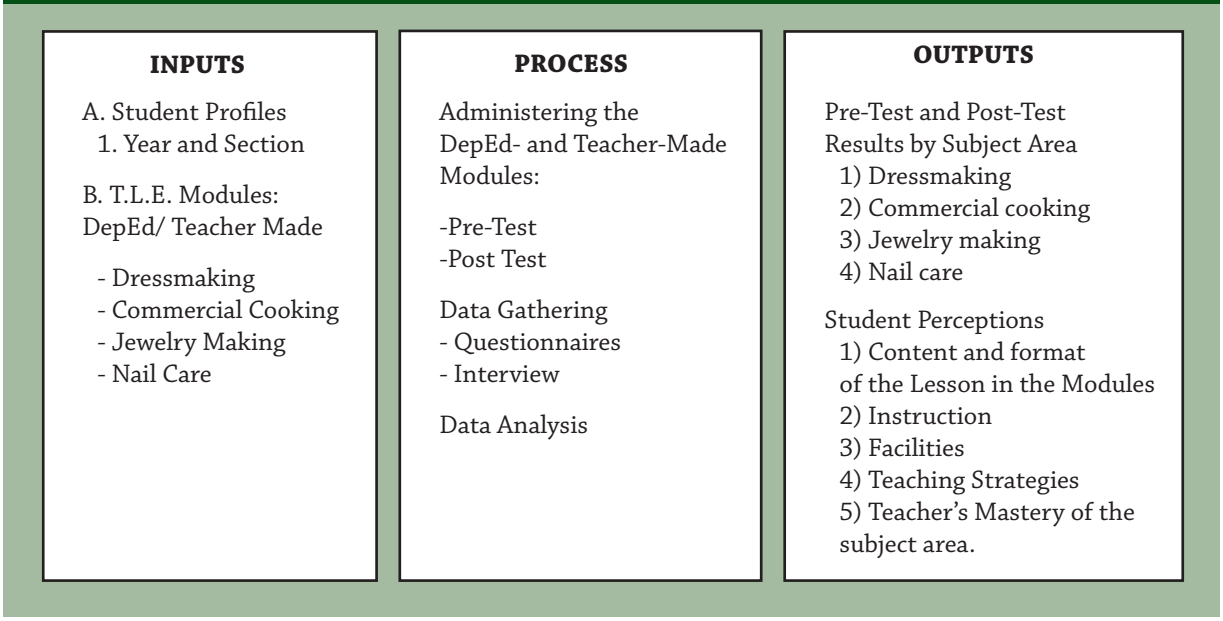
This study focused on the effectiveness of the modules that the respondents used during the entire school year (based on the pre-post test results). For the level of satisfaction, five categories towards achieving effectiveness of teaching and learning process were considered using the four different modules in TLE areas. From the beginning of the school year, students are asked to choose four TLE areas to take in the four quarters. The selected areas are a) dressmaking and tailoring, b) commercial cooking, 3. jewelry making, and 4) nail care.

Participants/Demographics of Respondents

The researcher purposely selected PNU-ITL, where two groups from the TLE Junior High School Grade 7 students were purposely chosen as participants. The study respondents are two

Figure 1

Study Framework



groups from PNU-ITL Department Grade 7-Matiyaga and Grade 7-Mapagbigay students, who were purposely chosen since they are on exploratory grade level. The total population is 30 students: 11 males and 19 females from Grade 7-Matiyaga, and 31 students: 12 males and 19 females from Grade 7- Mapagbigay. PNU is situated in Ermita, Manila, National Capital Region.

The Grade 7-Matiyaga and Grade 7-Mapagbigay students have ages ranging from 12 to 13 years old. The two groups are considered heterogeneous groups since there are only two sections in each year level in the Institute. However, the performance of the two groups in the pretest were significantly different (p-value of 0.01) in all the four subject areas implying the inherent superiority of the Grade7-Mapagbigay group (Table 1). Since, after the pretest, it was not possible to randomly assign the students who would take the two types of modules to ensure that the groups were homogenous, the research was continued only to test the effectiveness of the two modules.

Research Instruments

Grade 7- Matiyaga served as the experimental group (used the teacher-made modules), while Grade 7-Mapagbigay served as the control group (used the DepEd-provided modules). Before each grading period, the two groups were given a pretest to provide the teachers idea of how much knowledge those students already had about every TLE area they were about to take. After each grading period, the two groups were asked to take a post-test. The pretest and post-test results were then tested for any significant difference.

The study utilized another set of questionnaires to find out the students' perceptions of the format and content of the lessons in the modules, instruction, facilities, strategies of teaching, and teachers' mastery of the subject matter using a rating scale from excellent, very satisfactory, satisfactory, fair and needs improvement. Student respondents were asked to check the appropriate rating they can give to the modules they used and theto the teacher teaching the four different exploratory TLE areas taken for the whole school year.

Table 1

Pretest Results According to Subject Areas

Pretest Results According to Subject Areas	Teacher Made used by Grade 7-Matiyaga Pre-Test Mean Score	Dep-Ed Made used by Grade 7-Mapagbigay Pre Test Mean Score	*P*-value (Sig.)
Dressmaking	19.47	21.37	0.004
Commercial Cooking	16.03	17.81	0.009
Jewelry Making	19.96	20.52*	0.327
Nail Care	17.86	21. 81	0.000

**Both 7-Matiyaga and Mapagbigay used the Jewelry Making teacher-made module because at the time the research was done, there is no available DepEd Jewelry Making Module yet.*

Data Collection and Analysis

The research instruments were used and administered to the respondents. The teacher-made modules were used by Grade 7-Matiyaga, and the DepEd modules were used by Grade 7-Mapagbigay. After the approval of the Institute Director of PNU Manila, the survey questionnaires on student perceptions in five categories were distributed to the students. Collation, tabulation, analysis, and interpretation of data were made as soon as the answered questionnaires were collected. Frequency and percentage were used to analyze the data. *T*-test was utilized in determining the significant difference between TLE DepEd and Teacher-made Modules, considering the Pretest and Post-test results of the four different learning areas. The student perceptions of the earlier mentioned five different categories were evaluated using a "positively balanced rating scale" by Brown, Copeland and Millward (1973).

On ethical considerations, the data gathered in this research was kept with utmost secrecy. Before the actual facilitation of the study, written consent was requested from the participants' parents, allowing their children to be part of this research after they were given proper orientation about the study. The gathered data are used only for this study. Lastly, all collected data are discarded upon completion of the study.

Results and Discussion

Effectiveness of DepEd-Provided and Teacher-Made Modules

Effectiveness of the Teacher-Made Module (Grade 7- Matiyaga)

Table 2 shows that the computed t-value for dressmaking: -13.47, commercial cooking: -16.706, jewelry making: -11.089, and nail care: -12.471 were higher than the tabulated *t*-value at 0.01 level of significance, indicating that their post-test mean scores for the four areas were significantly higher than their pretest scores. This significant positive change implies that the teacher-made modules used by students in four areas were effective or resulted in effective classroom learning. Ambayon (2020) studied the literature on modular-based approach and student's achievement in Literature and found that after the modules were used by the college students taking Literature and validated by some Literature Professors, they concluded that the use of modules effectively and efficiently supported students in learning Mythology and Folklore. Thus, the use of module is recommended because it promotes student learning on their own strides, is more operational, and provides students' self-learning practice and exercise that motivates them and builds their curiosity.

Effectiveness of the Dep-Ed-Made Modules (Grade 7- Mapagbigay)

Table 3 shows that the computed *t*-value of

Table 2

Comparison of the Pretest and Post Mean Scores (n = 30), Grade-7 Matiyaga (Teacher-Made Modules)

		Mean	Std. Deviation	Std. Error Mean	t	p-value Sig. (2-tailed)
Pair 1	DM pre	19.470	2.224	0.4060	-13. 947	0.000
	DM post	25.867	2.432	0.4439		
Pair 2	CC pre	16.030	2.659	0.4850	-16.706	0.000
	CC post	21.367	3.439	0.6279		
Pair 3	JM pre	19.966	2.368	0.4397	-11.089	0.000
	JM post	25.241	2.773	0.5149		
Pair 4	NC pre	17.862	2.812	0.5222	-12.471	0.000
	NC post	22.207	3.560	0.6610		

Note: DM-Dressmaking; CC-Commercial Cooking; JM-Jewelry Making; NC-Nail Care

Table 3

Comparison of the Pretest and Post Mean Scores (n = 31), Grade-7 Mapagbigay (DepEd-provided Modules)

		Mean	Std. Deviation	Std. Error Mean	t	p-value Sig. (2-tailed)
Pair 1	DM pre	21.350	2.602	0.4671	-7.359	0.000
	DM post	30.323	5.758	0.0342	-11.056	
Pair 2	CC pre	17.810	2.496	0.4480		0.000
	CC post	22.065	1.879	0.3374	-10.824	
Pair 3	JM pre	20.516	3.223	0.5790		0.000
	JM post	27.000	1.770	0.3179	-9.719	
Pair 4	NC pre	21.806	3.188	0.5725		0.000
	NC post	26.774	1.839	0.3302		

dressmaking: -7.35, commercial cooking: -11.056, jewelry making: -10.824, and nail care: -9.719, comparing the pretest and post-test scores of the students who used the DepEd-promoted modules in four areas, indicates that their post-test mean scores were significantly higher than the pretest scores. This result implies that the DepEd-provided modules used by students in four areas are also effective. It resulted in effective learning that promotes greater student's performance and a sense of achievement.

Pedangle and Somaoang (2020) studied "The Implementation of Modular Distance Learning in the Philippine Secondary Public Schools" since the modular learning modality is popularly used in the Philippines during the Covid-19 pandemic. Digital and printed modules are used as students' resources for distance learning in which their parents and guardians served various roles to guide their children to learn at home by using the delivered self-learning modules provided by DepEd. It was mentioned that the use of learning modules encourages independent study on the part of the learners because it promotes better self-study and learning of concepts and skills among students with minimal or no assistance from others. And the use of modules

at home somehow helped each learner develop a sense of responsibility in accomplishing their tasks (Nardo, 2017).

Comparison of DepEd-Provided and Teacher-Made Modules

Table 4 shows that the post-test scores of the Grade 7-Mapagbigay students using the Dep-Ed module were generally higher than the Grade-7 Matiyaga using the Teacher-Made module in all four subjects. While based on the pretest scores, the Grade 7 Mapagbigay students appeared to already perform better than the Grade 7-Matiyaga in the Dress Making, Commercial Cooking and Nail Care subject area assessment. As cited by Ogbe and Omenka (2017), instructional materials like modules is a subset to educational technology. While, Ughamadu (1992) stated that instructional resources can be considered like a media materials that is entirely used in the class both by the students and the teachers to make the teaching and learning process effective and productive. Good to note also that instructional resources when appropriately utilized and with proper guidance and monitoring of teacher's ability to efficiently process teaching and learning process, it will surely give the richest possible learning environment that helped students and teachers achieved specific objectives in the shortest possible time.

Student Satisfaction with DepEd-Provided and Teacher-Made Modules

To determine how students perceived the effectiveness of modules considering the five categories that contribute towards effective teaching and learning process in the classroom, the mean score of the student's level of satisfaction were obtained after the facilitation of each TLE learning area. Table 5 shows the comparison of the mean scores on how students assess the five categories considered as part or the basis of the effectiveness of each module after using it in every grading period.

The results showed that for dress making, the descriptive equivalent of the mean value of the student satisfaction with the DepEd-provided module in terms of content and format is excellent while the teacher-made module was ated very satisfactory. The computed mean value of satisfaction rate as to Instruction was excellent for both modules. As to facilities, both modules were rated very satisfactory. As to student rating on teaching strategies and teachers' mastery of the subject area, both modules were rated excellent.

In the area of Commercial Cooking, both DepEd- and Teacher-made modules were rated as to lesson content format as very satisfactory; as to instruction and facilities; as to facilities, very satisfactory; and as to strategies of teaching and teachers' mastery of the subject area, both are excellent.

As to Jewelry Making, since it was only the teacher-made module that was used by the two sections, still it resulted excellent in content and format of the modules, instruction and facilities for Grade 7-Mapagbigay and Very Satisfactory for Grade 7- Matiyaga. As to strategies of teaching and teachers mastery of subject area, the rating is also excellent.

Table 4

Comparison of Post-Test Scores for Students Using Dep-Ed Provided and Teacher-Made Modules, PNU Grade 7 Students

Post-test Results According to Subject Areas	Dep-ed-Prescribed 7-Mapagbigay Post-Test Score	Teacher-Made used 7-Matiyaga Post-Test Score	Difference in Post-test Scores	*P*-value (Sig.)
Dressmaking	30.323	25.867	4.456	0.004
Commercial Cooking	22.065	21.367	0.698	0.327
Jewelry Making	27.000*	25.241	1.759	0.009
Nail Care	26.774	22.207	4.567	0.000

**used also teacher-made module*

For the subject area on nail care, the content and format of the lesson, instruction and facilities were rated very satisfactory. Strategies of teaching and teachers' mastery of the subject matter were rated excellent.

Overall, considering the five categories of teaching and learning process, the students perceived the TLE subject areas as very satisfactory.

Problems Encountered by Learners

Student respondents mentioned that the DepEd modules are too wordy and contain hypothetical terms. They mentioned that some information in the modules like in conversion of measurements is incorrectly supplied. Revision of some part of the module content is suggested.

As to facilities, lack of sewing machines and cooking utensils and equipment were encountered. The number of sewing machines were not enough for four groups. To solve the problem on lack of sewing machines, use of hand stitching in sewing and constructing their apron and head caps were resorted to. In addition, students also identified the problem on lack of cooking utensils. Students were asked to bring some of their utensils at home to the school just to be able to have actual cooking activities in the food laboratory room. This result corroborates the study of Limon (2016) in Ilocos Norte, where he proved that lack of educational facilities poses severe ramifications on student performance and achievement. Similarly, Tan (2021) concluded that schools need to provide adequate and required facilities, tools, equipment, supplies, and materials to implement fully any practical arts program and achieve improved learning.

Table 5

Comparison of the Pretest and Post Mean Scores (n = 30), Grade-7 Matiyaga (Teacher-Made Modules)

Categories		Dress Making		Commercial Cooking		Jewelry Making (Teacher Made Module only)		Nail Care	
		Mean	Interpt'n	Mean	Interpt'n	Mean	Interpt'n	Mean	Interpt'n
Content & Format	DepEd-provided	4.58	Excellent	3.93	VS	4.61*	Excellent	4,00	VS
	Teacher-made	3.67	VS	3.66	VS	4.30	VS	4.23	VS
Instruction	DepEd-provided	4.65	Excellent	4.57	Excellent	4.55*	Excellent	4,35	VS
	Teacher-made	4.53	Excellent	4.60	Excellent	4.34	VS	4.20	VS
Facilities	DepEd-provided	3.65	VS	3.68	VS	4.55*	Excellent	4.48	VS
	Teacher-made	3.57	VS	3.63	VS	4.17	VS	4.04	VS
Teaching Strategies	DepEd-provided	4.52	Excellent	4.65	Excellent	4.61*	Excellent	4.65	Excellent
	Teacher-made	4.50	Excellent	4.40	VS	4.67	Excellent	4.53	Excellent
Teaching Masteries	DepEd-provided	4.61	Excellent	4.77	Excellent	4.61*	Excellent	4,70	Excellent
	Teacher-made	4.80	Excellent	4.80	Excellent	4.67	Excellent	4.67	Excellent
Overall Mean	DepEd-provided	4.02	VS	4.32	VS	4.51*	Excellent	4.44	VS
	Teacher-made	4.21	VS	4.22	VS	4.43	VS	4.33	VS

**Teacher-made and DepEd module as evaluated by the two different sections*
**Jewelry Making Module used is Teacher Made Module only*

Legend: Level of Satisfaction

4.5 – 5.00	Excellent
3.5 – 4.49	Very Satisfactory
2.5 – 3.49	Satisfactory
1.5 – 2.49	Fairl
1.0 – 1.45	Needs Improvement

As to the time allocated for TLE subject areas during laboratory activities, students complained that one hour was not enough. They suggested that the Institute Director schedule TLE laboratory activities for two hours. The suggestion of a two-hour schedule for laboratory activities was approved in the second semester of the same school year, which helped achieve the teaching objectives for hands on activities.

Conclusions

This study concludes that both the DepEd and Teacher-made modules effectively improve student performance in the assessment test for the four TLE subject areas. This result shows that using modules as resource materials in the TLE teaching and learning process may help students learn more effectively in the classroom. This conclusion is supported by the very high level of satisfaction of students in the five categories of learning, implying that good quality instruction, relevant content and good format of every lesson in the modules, varied teaching styles, and strategies, sufficient facilities for every laboratory activity and teachers' mastery of the subject matter in different TLE areas are factors that promote effective learning and help produce effective, holistic, and skillful 21st-century learners. These qualities will serve as a strong foundation and early preparation that will make K to 12 learners self-sustainable and locally and globally prepared in their chosen field of work in the future.

Recommendations

Based on the results of this study, the following recommendations are posited. First, to make the TLE K-12 program effective and successful, teachers must always update and prepare themselves for all the changes and challenges in their area of discipline. Second, attending seminars and enrolling in different short TESDA and vocational courses will equip them with different knowledge and skills required to teach and meet the needs of their students. Third, teachers must possess long patience in guiding and monitoring their students' performance in written and practical assessments. Fourth, teachers must always try their best to give a meaningful and lively teaching-learning atmosphere that will inspire their students to learn with satisfaction and enjoyment inside the classroom. Fifth, a teacher must emphasize to their students the value of love of work to produce a genuine end product or output in every TLE area. As teachers, they must always have the initiative to find a way to have the equipment, tools, and utensils available in the laboratory room. Lastly, a teacher must always have an open, adaptive, and innovative mind to produce more teaching materials that will help teach and make learning objectives achievable.

Finally, the researcher recommends that another qualitative and quantitative research be conducted on the topic to validate the results and address the learner needs on effective and efficient teaching and learning processes in the school.

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