

Competencies in Home Economics of Grade 10 students in Mangatarem District

Migelyn Nimo Paborada, M.A.Ed., Rosario DL. Valencerina, Ed.D.
*Mangatarem National High School, Mangatarem, Pangasinan;
Pangasinan State University, Open University Systems, Lingayen Campus
migelynnimo@gmail.com, rosariovalencerina1005@gmail.com*

Abstract: *This study was designed to help students and educators to determine the level of manifestation of competencies in Home Economics of the Grade 10 students in Mangatarem District. Using this study, educators may be able to develop ideas working with appropriate support and attribution to help students more in attaining those competencies.*

The objectives of this study are to determine the profile of the Grade 10 Home Economics students in all school of Mangatarem District, their academic performance and their learning competencies for the First, Second and Third Quarter for the SY 2018-2019.

The study further found out that there is a significant relationship between the academic performance of the Grade 10 Home Economics Cookery students with the Learning Competencies in Home Economics. And there is no significant relationship on the academic performance of the Grade 10 Home Economics Handicraft students and their learning competencies in Home Economics.

The study also reveals that there is a significant relationship on the profile of Grade 10 Home Economics students in terms of their sex and family monthly income. However, it was found out that there is no significant relationship of the profile of Grade 10 Home Economics Handicraft with their Learning Competencies

Keywords: *Competencies, Home Economics, Academic Performance, Handicrafts*

INTRODUCTION

Technology and Livelihood Education has an extremely important place in our educational system today. No other academic discipline incorporates in its curriculum as many pertinent life skills that will help students succeed independent of their chosen career paths. Referring back to past studies and my own beliefs, I hope to help the reader understand the benefits of receiving an education in home economics and how the knowledge obtained

through this program will prove valuable throughout the lifespan.

The goal of Home Economics as a vocational subject is to equip students with all the pertinent practical knowledge and social skills necessary for them to take a productive role in the economy. A teacher of Home Economics education also has the sole responsibility of impacting this knowledge and skills to students in the subject area. The teacher implements curriculum, motivates learning, facilitates learning and guides learning in Home Economics for the benefit of the students and society [1].

The key to vocational education especially in Home Economics and most other purposeful education at all level while practice without praxeology will usually have adverse effects since it is not based on theory. It is therefore, more appropriate for students to have adequate exposure to both theory and practical aspects of the course [2].

Adequate competencies are needed by a graduate of Home Economics to be self-employed. Competency is a successful performance of a task through the use of knowledge, skills, attitude and judgment [3]. Competency-based Home Economics becomes more important with the need to reduce unemployment and promote self-employment. With competency-based Home Economics students will become more competent and empowered.

Studies from Pangasinan revealed there is a high level of perceived knowledge and skills of the teachers in on the innovative instructional activities [4]. The teachers also have high degree of professional characteristics particularly on decisiveness, resourcefulness, commitment and stress tolerance [5].

OBJECTIVES OF THE STUDY

The study was conducted to; help students and educators to determine the level of manifestation of competencies in Home Economics of the Grade 10 students in Mangatarem District. Using this study, educators may be able to develop ideas working with appropriate support and attribution to help students more in attaining those competencies.

Hence, students are expected to be competent in the areas of Home Economics, specifically Cookery and Handicrafts, the researcher considered this as an important aspect of research material.

To this effort, this study focused on the following concerns such as (1) the profile of the one hundred seventy-eight Grade 10 Home Economics Cookery students and thirty-two Grade 10 Home Economics Handicraft students in Mangatarem District. (2) dealt on the academic performance of the Grade 10 Home Economics students for the first, second and third quarter. (3) the degree of manifestation of competencies of the Grade 10 Home Economics students in Cookery and Handicraft.

(4) the significant relationship on the academic performance and of the Grade 10 Home Economics students learning competencies in cookery and handicraft, and (5) the significant relationship on the profile of the Grade 10 students with the Grade 10 Home Economics students learning competencies in cookery and handicraft.

MATERIALS AND METHODS

This study made use of the descriptive correlational research design. The study was conducted in all national high schools in Mangatarem District in Pangasinan I Division for the School Year 2018-2019 offering Cookery and Handicrafts. The respondents of this research were 178 Grade 10 Home Economics Cookery students and 32 Grade 10 Home Economics Handicraft students. The PART I of the questionnaire which is the profile was answered by the students and their respective TLE teachers was responsible on the competencies of the students.

The students' respondents were chosen using stratified random sampling.

The study utilized survey-questionnaire in gathering the necessary data needed for the completion of the study. It is a 5-page questionnaire for Cookery and 3-page questionnaire for Handicrafts containing items for the profile of respondents in terms of its age, sex, occupation, highest educational attainment of parents and their quarterly grades.

The survey questionnaire is a checklist type wherein the TLE teacher of the student answered and placed a check mark on the box provided opposite to the chosen answer. The questionnaire was based on the standard competencies of Cookery and Handicrafts as provided in the K to 12 Basic Education Curriculum for Technology and Livelihood Education.

Before the instrument was distributed among the respondents for the needed data, a letter seeking permission to conduct the study was given to the concerned individuals. This will further get the support and cooperation of the respondents and as a result for the success of the study.

RESULTS AND DISCUSSION

The results presented include the data gathered from Grade 10 Home Economics Cookery and Handicraft students in Mangatarem District through the conduct of the survey. Data were tallied, analyzed using

statistical tools, and presented in the form of tables.

PROFILE OF THE GRADE 10 STUDENTS IN MANGATAREM DISTRICT

This study gathered data from 178 Grade 10 Home Economics-Cookery students and 32 Grade 10 Home Economics-Handicraft students of Mangatarem District in School Year 2018-2019. Data on profile variables of these students like age, sex, occupation, highest educational attainment of parents and their quarterly grades are presented in Table 1. Simple tools like frequency and percentage were used to present the profile data of respondents.

Table 1
PROFILE OF THE GRADE 10 STUDENTS IN MANGATAREM DISTRICT

I. Age	COOKERY Students		HANDICRAFT Students	
	Frequency	Percentage	Frequency	Percentage
14	14		1	3.12
15	48	26.97	9	28.12
16	89	50	17	53.12
17	25	14.04	3	9.38
18	12	6.74	2	6.25
19	2	1.12		
20	2	1.12		
Total	178	100	32	100
Mean Age				
2. Sex				
Males	36	20.22	16	50
Females	142	79.78	16	50
Total	178	100	32	100
3. Highest Educational Attainment				
	Father	Mother	Father	Mother
College Graduate	27 (15.17%)	30 (16.85%)	5 (15.63%)	2 (6.25%)
Vocational Graduate	7 (3.93%)	16 (8.99%)	4 (12.50%)	5 (15.63%)
Secondary Graduate	115 (64.61%)	114 (64.04%)	18 (56.25%)	22 (68.76%)
Elementary Graduate	29 (16.29%)	18 (10.11%)	5 (15.63%)	3 (9.38%)
Total	178 (100%)	178 (100%)	32 (100%)	32 (100%)
4. Monthly Family Income				
Less than 5000	33	18.54	4	12.5
5000 – 10000	71	39.89	17	53.12
10001 – 15000	40	22.47	4	12.5
15001 – 20000	16	8.99	3	9.38
more than 20000	18	10.11	4	12.5
Total	178	100	32	100

For the respondents profile in terms of age, majority of the Grade 10 Home Economics Cookery students belong to 16 age group (50%). Likewise, 16 age group (53.12%) is the majority respondents of Grade 10 Home Economics Handicraft.

In terms of the sex of the Grade 10 Home Economics Cookery student respondents, females (79.78%) contributed a larger share of respondents than males (20.22%). For Grade 10 Home Economics Handicraft student respondents, male and female has the same percentage of share of respondents (50%).

With regards to the highest educational attainment of father and mother of the Grade 10 Home Economics Cookery students, majority are Secondary Graduate (64.61%-father) and (64.04%-mother). For the highest educational attainment of father and mother of the Grade 10 Home Economics Handicraft students, majority are also Secondary Graduate (56.25%-father) and (68.76%-mother).

For the family monthly income of Grade 10 Home Economics Cookery student respondents, the majority earns 5,000-10,000 (39.89%) followed by 10,001-15,000 (22.47%). For the Grade 10 Home Economics Handicraft student respondents, the majority also earns 5,000-10,000 (53.12%).

ACADEMIC PERFORMANCE OF THE GRADE 10 HOME ECONOMICS STUDENTS IN COOKERY AND HANDICRAFTS AREAS BASED ON THEIR FIRST, SECOND AND THIRD QUARTERLY GRADE OF S.Y. 2018-2019

The frequency of the academic performance of the Grade 10 Home Economics Cookery and Handicraft students based on their first, second and third Quarterly Grade for S.Y. 2018-2019 is reflected in Table 5.

Table 2
Academic Performance of the Grade 10 Home Economics Cookery and Handicraft students based on their first, second and third Quarterly Grade of S.Y. 2018-2019

With regards to the academic performance of the Grade 10 Home Economics Cookery and Handicraft respondents, the majority has a grade of 85-89 (51.69%). For the Grade 10 Home Economics Handicraft (71.88%).

GRADE POINT AVERAGE		COOKERY Students		HANDICRAFT Students	
Grading Scale	Descriptive Equivalent	Frequency	Percentage	Frequency	Percentage
75 -- 79	Fairly Satisfactory	5	2.81%	0	0
80 -- 84	Satisfactory	62	34.83%	4	12.5%
85 -- 89	Very Satisfactory	85	47.75%	23	71.88%
90 --100	Outstanding	26	14.61%	5	15.63%
		178	100%	32	100%

Table 3
Summary of Students GPA in Cookery and Handicraft

Table 3 reflects the summary of the mean grade point average (GPA) of the students in Cookery and Handicraft. Although the students in Cookery has a slightly lower mean of 86.10 compared to the students in Handicrafts with 87.25, both are considered very satisfactory. With regards to the median grade point average (GPA), the students in Cookery has 86.33 and the Handicrafts with 87.83. Consequently, the standard deviation obtained is 3.45 for the Cooker, and 2.54 for the Handicraft. The skewness obtained is -0.074 for the Cookery and -0.84; while the Kurtosis is 2.58 for Cookery and 3.6 for the handicraft. This implies that the GPA of the students in Cookery and Handicrafts are almost similar as reflected in Table 2.

Specialization	N	Mean GPA	Median GPA	SD	Skewness	Kurtosis	Lowest	Highest
Cookery Students	178	86.10(Very Satisfactory)	86.33	3.45	-0.074	2.58	77	94.67
Handicraft Students	32	87.25(Very Satisfactory)	87.83	2.54	-0.84	3.6	80.33	92

Figure 1: Histogram, Home Economics- Cookery

It shows that the graph follows the bell shape, where the mean and the median is in the highest point. Technically number of students within the both areas (left and right side) are slightly equal. The number of students who got lowest grades is equal to the students who got highest grades.

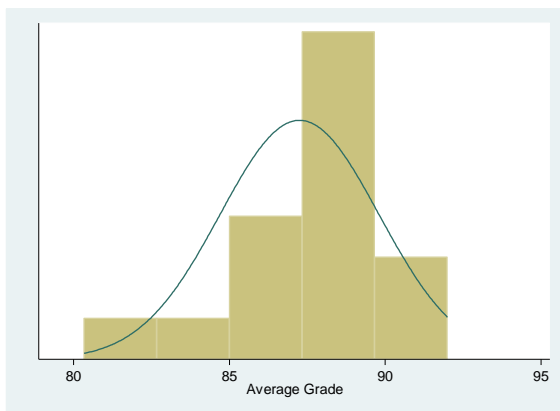
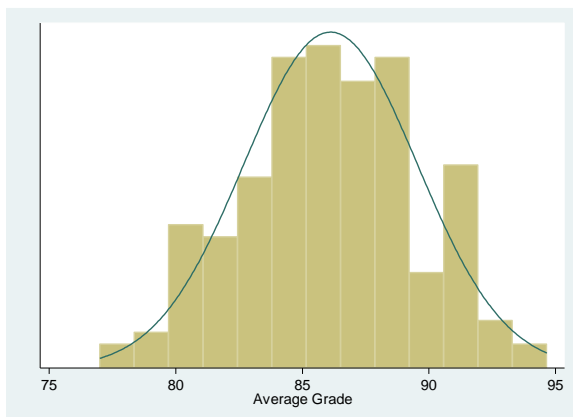


Figure 2: Histogram, Home Economics- Handicraft

The data in the following graph are left-skewed. Most of the sample values are clustered on the left side of the histogram. Its skewness tells that many students has a grade of more than the average of the class.



The low performance can be attributed to limited topics that were in depth by the teacher. Likewise, maybe some topics discussed were not of interest to students due to lack of motivation and appropriate teaching techniques where basic livelihood knowledge and skills were enhanced. Also, the low performance can also be attributed to time limitation when practicum or hands on performance are held and that TLE teachers are very busy in the group activities and one hour is not enough for practicum, hence academic subjects were disrupted.

DEGREE OF MANIFESTATION OF COMPETENCIES OF THE GRADE 10 HOME ECONOMICS STUDENTS IN COOKERY AND HANDICRAFT AREAS

Table 4 presents the degree of manifestation of competencies of Grade 10 Home Economics Cookery and Handicraft students. The TLE teachers who served as respondents are the ones identified the degree of manifestation of learning competencies of their students during the first, second and third quarterly grade School Year 2018-2019.

Table 4.1
DEGREE OF MANIFESTATION OF LEARNING COMPETENCIES IN HOME ECONOMICS COOKERY

Learning Competencies	Mean
Q1A. Lesson 1 Create Fashion Accessories	4.18 (HM)
B. Lesson 2 Calculate and Produce Fashion Accessory Material	4.15 (HM)
Q2A. Lesson 3 Preparation and Production of Fashion Accessories	4.22 (HM)
Q3A. Lesson 4: Perform Origami Production-Paper Craft (Vase/Frames)	4.18 (HM)
OVERALL WEIGHTED MEAN	4.186 (HM)

Overall, the TLE teachers rated that their students learning competencies was highly manifested as reflected in the summated mean 4.18. The ratings given shows that most of the Grade 10 Home Economics Cookery students knows how to evaluate their finish products and they love to learn and explore new things when it comes to handling food.

The findings is supported by the findings of Smith, that teaching is the interaction between the teacher and the students. As molders of young minds, teachers should endeavor to pin the means by which they can best initiate experiences that would lead to meaningful learning. Students learn to explore and understand the environment with the help of the teacher [6].

Table 4.2
DEGREE OF MANIFESTATION OF

LEARNING COMPETENCIES in HOME ECONOMICS COOKERY	Spearman Rho (p)	p-value	Conclusion
A. Lesson 1: Preparation of Egg Dishes	0.3678	0.0001	significant
B. Lesson 2 Prepare Cereals Starch Dishes	0.3453	0.0001	significant
Q2A. Lesson 1: Prepare Vegetable Dishes	0.4035	0.0001	significant
B. Lesson 2: Prepare and Cook Seafood Dishes	0.3281	0.0001	significant
Q3A. Lesson 1 Prepare stocks, sauces soups	0.3477	0.0001	significant
B. Lesson 2 Preparation of Poultry for Cooking	0.3551	0.0001	significant
Over all Characteristics	0.3502	0.0001	significant

LEARNING COMPETENCIES IN HOME ECONOMICS HANDICRAFT

The Table 4.2 presents the weighted mean and descriptive rating of manifestation of learning competencies of Home Economics Handicraft. The highest weighted mean is 4.39 with a descriptive equivalent of “Highly Manifested” shows that most of the Grade 10

Home Economics Handicraft students in Mangatarem District can select materials, tools and equipment in making fashion accessory projects/ products. Overall, the learning competencies has a weighted mean of 4.186 descriptively equivalent to “highly manifested”. Based from the collected data, this means that the Grade 10 Home Economics Cookery students in Mangatarem District are competent in creating fashion accessories and identifying the fashion accessory cost component.

RELATIONSHIP ON THE ACADEMIC PERFORMANCE OF THE GRADE 10 HOME ECONOMICS STUDENTS WITH THEIR COMPETENCIES IN COOKERY AND HANDICRAFT

To establish the relationship on the academic performance of the Grade 10 Home Economics students and the Competencies in Home Economics Cookery and Handicraft, the Spearman Rho was used. Results of the test of significant relationship between the academic performance of the Grade 10 Home Economics Cookery students and their Learning Competencies in Cookery is shown in Table 5.1. For the results of the test significant relationship between the academic performance of the Grade 10 Home Economics Handicraft students and 5.2.

Table 5.1
RELATIONSHIP BETWEEN THE STUDENTS ACADEMIC PERFORMANCE AND COMPETENCE IN HOME ECONOMICS COOKERY

Learning Competencies	Mean
Q1A. Lesson 1: Preparation of Egg Dishes	4.08 (HM)
B. Lesson 2 Prepare Cereals Starch Dishes	3.99 (HM)
Q2A. Lesson 1: Prepare Vegetable Dishes	4.06 (HM)
B. Lesson 2: Prepare and Cook Seafood Dishes	4.25 (HM)
Q3A. Lesson 1 Prepare stocks, sauces soups	4.16 (HM)
B. Lesson 2 Preparation of Poultry for Cooking	3.97 (HM)
OVERALL WEIGHTED MEAN	4.18 (HM)

Data in table 5.1 reveals that a positive relationship between the academic performance of the Grade 10 Home Economics students and

their Learning Competencies in Cookery. This evident in the average Spearman Rho value of 0.3502 and the significance of 0.0001 which is lower than the set significance of 0.05. Hence, it implies that the academic performance of that Grade 10 Home Economics students and the competencies in cookery is related.

Table 5.2
RELATIONSHIP BETWEEN THE STUDENTS ACADEMIC PERFORMANCE AND COMPETENCE IN HOME ECONOMICS HANDICRAFT

The results show that the null hypothesis which states there is no significant relationship between the students' academic performance and the Grade 10 competencies in Home Economics Handicraft is accepted. This means that the learning competencies in Home Economics Handicraft has no something to do with their academic performance.

It could be noted in the Table 5 that the majority of the students had a very satisfactorily grade in academic performance from First to Third Quarter.

On the other hand, visual investigation of the table indicates that all identified learning competencies are not significantly related with the Academic Performance of the Grade 10 Home Economics Handicraft students in Mangatarem District. This means that, based from the data gathered, academic average and the Competencies in Home Economics Handicraft for the First to Third Quarter are unrelated.

LEARNING COMPETENCIES in HOME ECONOMICS COOKERY	Spearman Rho (p)	p-value	Conclusion
Q1A. Lesson 1 Create Fashion Accessories	0.1708	0.3888	not significant
B. Lesson 2 Calculate and Produce Fashion Accessory Material	0.0526	0.6461	not significant
Q2A. Lesson 3 Preparation and Production of Fashion Accessories	0.2123	0.3720	not significant
Q3A. Lesson 4: Perform Origami Production-Paper Craft (Vase/Frames)	0.1061	0.5657	not significant
Overall Characteristics	0.1626	0.4304 4	not significant

RELATIONSHIP OF THE PROFILE OF THE GRADE 10 HOME ECONOMICS STUDENTS WITH THEIR COMPETENCIES IN COOKERY AND HANDICRAFT

To make the analysis of the profile of the Grade 10 students with the Learning Competencies in Home Economics Handicraft, the table above is the statistical relationship test performed for this particular problem.

The first column on the Table 9.1 indicates the Learning Competencies in Home Economics Cookery and Handicraft for the First-Third Quarter while the second to sixth column shows the students profile, each column indicates the computed value of the statistical test that was used in comparing the students profile and the Learning Competencies in Home Economics Cookery and Handicraft. Also each column displays the associated p (probability) value of the statistical test used which will guide the researcher in making a definitive conclusion about the problem at hand.

TABLE 6.1

**RELATIONSHIP BETWEEN THE
 STUDENTS PROFILE AND
 COMPETENCE IN HOME ECONOMICS
 COOKERY**

Learning Competencies	Age	Sex	Highest Educ'tl Attainment of father	Highest Educ'tl Attainment of mother	Family monthly income
Q1A. Lesson 1: Preparation of Egg Dishes	21.37 (0.12)	32.84 (0.0001)	16.36(0.47)	21.07(0.21)	29.27(0.01)
B. Lesson 2 Prepare Cereals Starch Dishes	91.64 (0.007)	24.74 (0.0001)	16.93(0.88)	19.65(0.72)	50.4(0.09)
Q2A. Lesson 1: Prepare Vegetable Dishes	47.13 (0.001)	20.30 (0.0001)	17.24(0.64)	18.32(0.57)	54(0.0001)
B. Lesson 2: Prepare and Cook Seafood Dishes	17.22 (0.36)	22.24 (0.0001)	13.99(0.53)	11.22(0.70)	24.73(0.17)
Q3A. Lesson 1 Prepare stocks, sauces soups	47.98 (0.010)	16.73 (0.009)	15.53(0.68)	21.21(0.41)	38.4(0.01)
B. Lesson 2 Preparation of Poultry for Cooking	31.61 (0.05)	23.14 (0.0001)	16.16(0.71)	15.15(0.77)	31.7(0.11)
Overall Characteristics	43.7 (0.11)	18.56 (0.012)	21.55(0.49)	20.7(0.4)	33.6(0.23)
	not significant	significant	not significant	not significant	significant

highest educational attainment of their father and mother.

Still, on the same table, it could be observed that the computed Pearson value for “sex” is 18.56 with a level of significance 0.012, and the Pearson value of “family monthly income” is 333.60 with a level of significance 0.023. Hence, the student’s sex and the family monthly income has a relationship with the learning competencies of Grade 10 Home Economics Cookery.

Table 6.1 shows correlation of students profile and competence in Home Economics Cookery for the First to Third Quarter. The table shows that the average computed Pearson value for “age” is 43.73 with a level of not significance of 0.11, Pearson value of 21.55 for “sex” with a level of 0.012, Pearson value of 21.55 for “highest educational attainment of father” with a level of 0.486 Pearson value of 20.69 for “highest educational attainment of mother” with a level of not significance of 0.48, and Pearson value of 33.60 for “family monthly income” with a level if 0.023. This further means that the learning competencies is not related to the age and the

TABLE 6.2
RELATIONSHIP BETWEEN THE
STUDENTS PROFILE AND
COMPETENCE IN HOME ECONOMICS
HANDICRAFT

Learning Competencies	Age	Sex	Highest Educ'tl Attainment of father	Highest Educ'tl Attainment of mother	Family monthly income
Q1A. Lesson 1 Create Fashion Accessories	6.416 (0.496)	0.427 (0.809)	14.050(0.145)	7.911(0.461)	6.643 (0.582)
B. Lesson 2 Calculate and Produce Fashion Accessory Material	11.14 (0.326)	3.80 (0.363)	11.14(0.35)	12.00(0.21)	4.31 (0.826)
Q2A. Lesson 3 Preparation and Production of Fashion Accessories	14.765 (0.292)	3.019 (0.400)	11.856(0.47)	15.402(0.211)	8.265 (0.6)
Q3A. Lesson 4: Perform Origami Production-Paper Craft (Vase/Frames)	24.923 (0.071)	2.679 (0.613)	26.411 (0.153)	36.52 (0.002)	0.406 (0.218)
Overall Characteristics	18.21 (0.259)	2.14 (0.569)	21.02 (0.22)	19.96 (0.14)	7.89 (0.53)
	not significant	not significant	not significant	not significant	not significant

Table 6.2 show correlation of students profile and competence in Home Economics Cookery for the First to Third Quarter. Table show that the average computed Pearson value for “age” is 18.21 with a level of not significance of 0.259, Pearson value of 2.14 for “sex” with a level of not significance of 0.569, Pearson value of 21.02 for “highest educational attainment of father” with a level of not significance of 0.22, Pearson value of 19.96 for “highest educational attainment of mother” with a level of not significance of 0.14, and Pearson value of 7.89

for “family monthly income” with a level of not significance of 0.53.

This further means that the learning competencies is not related to the students profile variables with with the learning competencies of Grade 10 Home Economics Handicrafts.

CONCLUSION AND RECOMMENDATION

Based on the results of the investigation, the following conclusions were formulated:

Majority of the Grade 10 Home Economics Cookery and Handicraft student respondents were 16 years old. Most of the respondents were female. Majority of their father and mother are both Secondary Graduates. On the other hand, most of the respondents has the monthly family income ranging 5,000-10,000.

Most of the Grade 10 Home Economic students has an academic grade of 85-89.

The Grade 10 Home Economics Cookery and Handicrafts respondents were rate with a descriptive equivalent of “Highly Manifested”.

There is a significant relationship between the academic performance of the Grade 10 Home Economics Cookery students with the Learning Competencies in Home Economics.

There is no significant relationship between the academic performance of the Grade 10 Home Economics Handicraft students with their learning competencies in Home Economics.

There is a significant relationship on the profile of Grade 10 Home Economics students in terms of their sex and family monthly income.

There is no significant relationship on the profile of Grade 10 Home Economics Handicraft to the Learning Competencies.

Based on the result of the study, the following are recommended:

1. TLE teachers should engage more activities to evaluate the performance of the Grade 10 Home Economics students for them to know what personal, skills and learning competencies that needs improvement. Evaluation can be done by giving more on hands-on activities that is relevant in their areas of specialization.
2. It is suggested that Home Economics in all schools should have their own laboratories in every areas of specialization, including the tools and equipment.
3. **More trainings and seminars for TLE teachers and also for the students should be conducted by the DepEd.**

- [5] Queroda, P. (2017). Professional Characteristics of Education Teachers in Pangasinan. Southeast Asian Journal of Science and Technology, 2(1). Retrieved from <https://mail.psu.edu.ph/zdomains/j.sajst.org/index.php/sajst/article/view/44>
- [6] Smith. (2013). Enhancing Competency of Teachers: A Teaching-and Learning Enhancement Guide. Retrieved from books.google.com.ph/books

REFERENCES

- [1] Funmilayo, A (2013). Home Economics Department, Federal College of Education.
- [2] Agwasim B.J and Agwasim M.C (1995) Teaching Vocational Home Economics in College of Education and Universities. Port Harcourt. Basmark Publishing Company.
- [3] Olaitan and Ali (1997). The Making of Curriculum (Theory, Process, Product and Evaluation) Cape Publishers International Limited. Onitsha Nigeria.
- [4] Queroda, P. (2018). Perceived Knowledge and Skills of Teachers in Innovative Instructional Activities . Southeast Asian Journal of Science and Technology, 3(1). Retrieved from <https://mail.psu.edu.ph/zdomains/j.sajst.org/index.php/sajst/article/view/45>