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Assessing Technology and Livelihood Education Skills and Academic Performance of Elementary Pupils in Digos City

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Abstract. This study aimed to investigate the significant relationship between Technology and Livelihood Education skills and the performance of elementary pupils, providing a basis for an intervention program. A non-experimental, quantitative research design employing a descriptive correlational approach was used in the study, which involved 324 public elementary grade six pupils in the Digos Oriental district, Digos City, Philippines. The primary data source for this study was a teacher-made or self-designed instrument and a validated survey questionnaire. The study found that the overall respondents' level of skills was a mean score of 2.71, described as proficient or average, across the areas of Technology and Livelihood Education, including Agri-Fishery Arts, Home Economics, Industrial Arts, Entrepreneurship, and ICT. Furthermore, the pupils' TLE skills suggested that the study sample was primarily composed of different statements, but with corresponding means and descriptive levels. In terms of TLE pupils' level of skills, the results revealed that both Agri-Fishery Arts and Home Economics achieved the same mean score of 2.76, ranking them in the highest category. However, there were some pupils ' skills/competencies in Home Economics, Industrial Arts, and ICT who did not meet the standard requirements of the industries for future employment. In addition, pupils' TLE performance was rated at a very satisfactory level in the specified areas of TLE. Furthermore, no significant correlation was found between TLE skills and the performance of elementary pupils; therefore, administrators may address the diverse population of grade six pupils by revising the curriculum and proposing further enhancements to the training or intervention program. TLE teachers can continually improve the systems and procedures in delivering their instruction and consider additional intervention programs or goal-oriented actions through integrative and collaborative activities as part of the competency or skills management program.

Keywords: Intervention program; Performance; Technology and Livelihood Education; Technology and Livelihood Education skills.

1.0 Introduction

Learners are the most excellent resource of every country and the most effective agents and managers of change. To achieve these capabilities, they must be equipped with essential knowledge and transferable skills that apply to personal lives and success in learning life and work, especially for learners in this millennial age. On the other hand, one of the key educational pathways for developing these essential life and work skills among learners is through Technology and Livelihood Education (TLE), a core subject in the basic education curriculum that fosters

functional literacy and practical competencies (Basal, 2022). However, according to Casiño and Tantiado (2024), despite the importance given to classroom training in performing TLE tasks, there appear to be learners who are passive in terms of learning outcomes. The academic ratings and performance in technology and livelihood education subjects are commensurate with the level of interest and participation they have shown in their class. Based on the researcher's observation, teaching in elementary school can be a challenging task for teachers, as it significantly demands strong competencies to develop the knowledge and skills of pupils as indicated in the curriculum. Therefore, they must have the capacity to act based on the expertise or skills of the learners and to respond to the needs of diverse learners (Eden & Onyebuchi, 2024). The DepEd elementary teachers experienced inequity in attending seminars and training due to their busy class schedule and other school-related functions. In addition, corollary to this, teaching the TLE subject may not be practical, as the curriculum requires teachers to develop specific competencies to deliver quality instruction (Elli & Ricaffort, 2020).

Furthermore, the Bureau of Curriculum Development facilitated a review process for EPP/TLE in 2018, aligning with the K-10 curricula initiated in 2019. The aims were to enhance learners' engagement, experiences, and outcomes in EPP/ TLE. The findings revealed that curriculum congestion, overlapping competencies, underdeveloped entrepreneurial skills, and varying complexity of ICT competencies across grade levels are the identified gaps, issues, and concerns across all learning areas and grade levels. Furthermore, according to Salvador et al. (2022), teaching subjects outside one's specialization is a significant concern for teachers in the Philippines. This scenario also affects the learning of learners, thus creating gaps in their overall performance. Similarly, Abella et al. (2021) stated that teaching outside one's specialized field can harm both teachers' and pupils' learning outcomes; consequently, failing to meet required competencies often leads to compromised performance. In line with this, it is evident that it could affect teacher credibility, making them feel inept in many aspects of their assigned duties (Salvador et al., 2022). In addition, De Jesus and De Jesus (2021) noted that public school teachers play a crucial role in students' growth, as they are the ones who impart competencies and resources to them. They are challenged to become the catalyst for change in specific behaviors among their learners, as they aim to create positive impacts in society and prepare youth to make the country competitive in the 21st century. Hence, teacher competency should be ensured, especially in subject areas that have relevance and impact on society, such as Technology and Livelihood Education.

As a result, the researcher was driven to conduct the study to determine the technology and livelihood education skills, as well as the academic performance, of grade six (6) elementary pupils, providing a basis for an intervention program in public elementary schools in the Digos Oriental District, Digos City.

2.0 Methodology

2.1 Research Design

The study employed a non-experimental quantitative research design with a descriptive correlational approach. The descriptive aspect enabled the determination of the level of skills of Grade VI pupils in TLE in terms of agri-fishery arts, home economics, industrial arts, entrepreneurship, and ICT. To determine the level of academic performance of pupils based on their final grades for academic year 2023-2024. A correlational method is used to determine if there is a significant relationship between skills in terms of TLE-identified areas and pupils' performance, as measured by final quarter grades. Evaluative designs were employed to determine whether an action plan or intervention can be developed to enhance the skills and performance of pupils in various areas of the TLE subject.

2.2 Research Locale

The study was conducted in the Digos Oriental District, Digos City, Davao del Sur Province, Southern Mindanao, Philippines. This study's research area included nine (9) public elementary schools in Digos Oriental District, Division of Digos City. The schools are evenly dispersed across the district and are accessible through ground transportation. The Department of Education oversees these public elementary schools.

2.3 Research Participants

The total population of public elementary grade six pupils in the nine (9) public schools of Digos Oriental District, Division of Digos City, is 1,708. The acceptable sample size of 324 respondents was determined using Slovin's formula at a 0.05 significance level. These grade six (6) elementary pupils were randomly selected from the target

population. Stratified random sampling was employed to ensure proportional representation across schools. These Grade 6 pupils also came from the nine public elementary schools in the Digos Oriental district of Digos City, Digos City Division. The criteria for selecting the respondents were grade 6 pupils in the Digos Oriental district, chosen regardless of sex, age, or tribe.

2.4 Research Instrument

This study employed a teacher-made test, or self-designed instrument, as the primary data source and main research tool to answer the research questions. This study adhered to ethical guidelines, and participation was voluntary for all respondents. To validate the instruments. Several steps were taken. To ensure study objectives were met, assessment experts reviewed the teacher-made or modified questionnaires. Second, a reliability/pilot test was conducted involving 30 grade 6 respondents who are not part of the actual study to ensure the validity of the research instrument. Cronbach's alpha was used for this purpose; the test results showed good reliability and internal consistency with values ranging from 0.804, which is greater than 0.70.

2.5 Data Gathering Procedure

This study used specific steps to collect data. First, permission to conduct the study was obtained from the Schools Division Superintendent, following the recommendation of the Dean from the Graduate School. Second, upon approval, another letter was submitted to the School Principals or District Supervisors asking for permission to administer the survey instrument. Third, after being granted the permit, I explained the purpose of the study to the pupil-respondents and instructed them on how to complete the questionnaire. Fourth, once all respondents had answered and completed the research questionnaires, the researcher personally retrieved the completed copies of the instruments. Lastly, the researcher assured the respondents that all of their responses would be kept strictly confidential and that the study's results would only be used for academic and educational purposes.

2.6 Ethical Considerations

This research study followed ethical guidelines. The respondents' participation was voluntary. The consent letters were given to the respondents to seek their permission. The dignity and well-being of elementary pupils who responded were always protected. The research data remained confidential throughout the study, and the respondents' rights were protected, ensuring the scientific and academic integrity of the research.

3.0 Results and Discussion

Table 1. *Consolidated Findings of the Level of TLE Skills of Elementary Pupils in terms of Agri-Fishery Arts*

Indicators	Mean	Description	Interpretation
Determine the importance of planting or propagating trees to the people, animals, and environment.	2.80	Neutral	Proficient
Identify the factors to be considered in planting trees and fruit-bearing trees.	2.63	Neutral	Proficient
Identify the types of orchard farms and the proper methods for planting/propagating trees.	2.67	Neutral	Proficient
Prepare a simple backyard garden using the information gathered	2.88	Neutral	Proficient
Propagate trees or fruit-bearing trees using a step-by-step procedure	2.92	Neutral	Proficient
Perform proper ways of caring for trees/seedlings, such as watering, cultivating, preparing, and applying organic fertilizer	2.80	Neutral	Proficient
Gather information about the benefits of animal/fish raising	2.63	Neutral	Proficient
Suggest for the family's animal raising project and help with marketing of animals/fish raised	2.74	Neutral	Proficient
Total Measure	**2.76**	**Neutral**	**Proficient**

Note:			
	4.20-5.00	Strongly Agree	Excellent
	3.40-4.19	Agree	Highly- Proficient
	2.60-3.39	Neutral	Proficient
	1.80-2.59	Disagree	Developing
	1.00-1.79	Strongly Disagree	Beginner

The results (see Table 1) showed significant information on the level of TLE skills in terms of agri-fishery arts among the 324 grade six (6) elementary pupils. The mean scores consistently indicate proficient ratings, suggesting a proficient level of TLE skills in agri-fishery arts among respondents. The pupils were able to propagate trees or fruit-bearing plants using step-by-step procedures, gaining the highest response of 2.92, which was considered neutral. This implied that the pupils' level of skill was proficient. While the least response was that the pupils were able to identify the factors to be considered in planting trees and fruit-bearing trees, as well as gather information about the benefits of animal/fish raising, which were both given a 2.63 mean, described as neutral,

and proficient. The overall total measure, with an overall total mean score of 2.76, implied that the pupils employed a level of skills at a proficient level to seek opportunities to apply across areas. Acknowledging the importance of agri-fishery arts competencies is not only helpful in developing their skills but also in recognizing their potential to become future entrepreneurs (Sotto, 2020).

Table 2. *Consolidated Findings on the Level of Skills of Elementary Pupils in terms of Home Economics*

Indicators	Mean	Description	Interpretation
Identify family needs and sources of family income	3.15	Agree	Highly-Proficient
Prepare a practical budget for basic and social needs	2.95	Neutral	Proficient
Classify sewing tools and materials according to their use (measuring, cutting, marking)	2.97	Neutral	Proficient
Prepare project plan, materials, tools, and draft pattern for household linens	2.83	Neutral	Proficient
Sew creative and marketable household linens as a means to augment family income	2.47	Disagree	Developing
Sell finished household linens in varied/ creative ways.	2.53	Disagree	Developing
Enumerate the different methods of food preservation	2.73	Neutral	Proficient
Apply the principles and skills in preserving foods by using tools and equipment	2.72	Neutral	Proficient
Market preserved /processed food in varied/ creative ways with pride	2.47	Disagree	Developing
Total Measure	**2.76**	**Neutral**	**Proficient**

The mean scores provide an overall assessment, indicating the proficiency level of pupils' skills in home economics. As shown in Table 2, in terms of family needs and sources of family income, which gained a 3.15 mean score, described as 'agree'. Pupils demonstrated a highly proficient level of understanding about the importance of identifying family needs and how to manage family income sources effectively. In contrast, sewing creative and marketable household linens and market-preserved processed food in varied/creative ways with pride, which gained a 2.47 mean score as ''developing level.' 'It implied that the pupils were not able to meet the standard requirements for future employment. In this regard, interdisciplinarity, as well as learning methods that support pupils' problem-solving skills and higher-order thinking skills, are essential values (Gelinder et al., 2020).

Table 3. *Consolidated Findings on the Level of TLE Skills of Elementary Pupils in terms of Industrial Arts*

Indicators	Mean	Description	Interpretation
Learn the importance and methods for enhancing or decorating bamboo, wood, and metal products.	2.70	Neutral	Proficient
Apply creativity in enhancing/ decorating bamboo, wood, and metal	2.56	Disagree	Developing
Identify the effects of innovative finishing materials and creative accessories on the marketability of products	2.47	Disagree	Developing
Create and sell bamboo, wood, or metal products	2.56	Disagree	Developing
Construct simple electrical gadgets and explain the processes in making gadgets.	2.27	Disagree	Developing
Repair simple gadgets/ furniture/ furnishings at home and school	2.51	Disagree	Developing
Classify recyclable products/ waste materials and explain the process and the importance of recycling	3.11	Neutral	Proficient
Recycle the identified products/waste materials into functional items.	2.85	Neutral	Proficient
Total Measure	**2.63**	**Neutral**	**Proficient**

The results, as shown in Table 3, indicate that the skills or competencies of TLE pupils in industrial arts were proficient. The pupils were able to classify recyclable products/waste materials, explaining the process and importance of recycling, which resulted in the highest mean score at the proficient level. However, the specific competencies or skills for industrial arts such as the following: constructing simple gadgets and explaining the process in making gadgets; repairing simple gadgets/furniture/furnishing at home and school; applying creativity in enhancing/decorating bamboo, wood, and metal; creating and selling bamboo, wood or metal products, should be considered for targeted interventions or training program proposal for TLE skills enhancement. Not all learners can accommodate the learning process, resulting in different outcomes (Asio & Jimenez, 2020). Therefore, teachers and school administrators need to create an intervention plan or develop intervention materials for low-performing pupils to improve and enhance their mastery of specific skills or competencies.

As indicated in Table 4, the highest response, with a mean score of 2.96, described pupils as being able to buy products based on their needs and demands in school and at home, which was categorized as neutral and proficient. The least response was that pupils were unable or had difficulty using functions and formulas in an electronic spreadsheet tool to perform advanced calculations on numerical data, which received a mean score of

2.22, indicating a level of disagreement or development. The results showed that the pupils' skills were insufficient in performing the task related to using advanced features of a slide presentation tool to create a multimedia presentation with text, graphics, and photos, as well as hyperlinked elements, animations, and embedded audio and video, which received a lower response of 2.47. This implied that the level of pupils' skills or competency was at a developing level, or that the pupils had not acquired the practical knowledge and skills required as one of the qualifications for future employment opportunities. According to Indriani et al. (2021), the 21st generation possesses the eloquent characteristics of technology, social media, and intense communication and multi-tasking. Teachers should focus on developing 21st-century skills, literacy, and higher-order thinking skills (HOTS) that are integrated into the learning process, taking into account the methods and media to be used, as well as classroom management, so that 21st-century skills are truly achieved. Therefore, the effective incorporation of ICT is a general prerequisite that teachers must carefully undertake to guide learners in achieving the aforementioned skills (Gaurino et al., 2023). Generally, the total measure of pupils' skills in terms of Entrepreneurship and ICT shows a mean score of 2.69, indicating proficiency. This implied that the pupils can demonstrate some understanding and skills in home management, entrepreneurship, and ICT.

Table 4. *Consolidated Findings on the Level of Skills of Elementary Pupils in terms of Entrepreneurship and ICT*

Indicators	Mean	Description	Interpretation
Identify the seller and buyer.	2.90	Neutral	Proficient
Produce simple products	2.74	Neutral	Proficient
Buy products based on need and demands in school and at home	2.96	Neutral	Proficient
Post and share materials on social media in a safe and responsible manner	2.81	Neutral	Proficient
Participate in video and audio conferences in a safe and responsible manner	2.76	Neutral	Proficient
Aware of the advantages and the disadvantages of using an online tool to gather data	2.70	Neutral	Proficient
Use functions and formulas in an electronic spreadsheets tool to perform advanced calculations on numerical data	2.22	Neutral	Proficient
Use video, audio conferencing tools, and e-group to share ideas and work with/ others online	2.64	Neutral	Proficient
Utilize the advanced features of a slide presentation tool to create a multimedia presentation that incorporates text, graphics, photos, hyperlinked elements, animations, and embedded audio and/or video.	2.47	Disagree	Developing
Total Measure	**2.69**	**Neutral**	**Proficient**

Table 5. *Summary of the Level of Technology and Livelihood Education Skills of Elementary Pupils*

Indicators	Mean	Description	Interpretation
Agri-fishery Arts	2.76	Neutral	Proficient
Home Economics	2.76	Neutral	Proficient
Industrial Arts	2.63	Neutral	Proficient
Entrepreneurship and Information and Communication Technology (ICT)	2.69	Neutral	Proficient
Total Measure	**2.71**	**Neutral**	**Proficient**

The results in Table 5 showed the summary information on the extent of the level of Technology and Livelihood Education (TLE) skills of the 324 grade six (6) elementary pupils. Based on the result of pupils' response, the level of skills of pupils revealed that they have a proficient level across four (4) areas of TLE, including Agri-Fishery Arts, Home Economics, Industrial Arts, Entrepreneurship, and Information and Communication Technology. It indicated that the level of pupils' skills in the identified areas of TLE was at a neutral or average level. It is generally interpreted as proficient in performing different skills in the TLE subject. However, some skills /competencies in Home Economics, Industrial Arts, and ICT were not met by the pupils as required by industries to bridge the gap in the skills/competencies of grade 6 pupils in TLE. By providing training in these skills/ competencies, pupils could acquire and train the competencies required by the employment industries. Moreover, learners with a higher level of TLE skills in the identified areas are typically excellent or more proficient at acquiring new skills. These skills facilitate effective ways to improve the pupil's quality of life. From Fernando's (2020) perspective, learners should have hands-on experiences to complete tasks that replicate real-world scenarios.

Table 6. *Consolidated Findings of the Level of Elementary Pupils' Performance in TLE*

Indicator	Max	Min	Mean	Descriptive Level
Performance	98	75	88.26	Very Satisfactory

The results showed that the overall mean score in the pupils' final grade is 88.26, described as very satisfactory (see Table 6). This finding suggests that the pupils possess a broad range of knowledge and skills in various areas

of technology and livelihood education. The data suggest that the level of pupils' performance in TLE is characterized by how learners feel about their learning. It is similar to emotional engagement, which is a strong predictor of pupils' performance or outcomes in education, including learning, grades, achievement, and retention. This makes the teacher a knowledge expert and feels satisfied in their teaching when they can ensure that the learning competencies are attained and pupils' performance is excellent. Although some pupils received a final grade of 75, which means reasonably satisfactory, the overall performance of the pupils was competent as a whole.

Table 7. *Test of Significance on the Correlation between TLE Skills and Performance of Pupils*

-	Performance			
	r- Value	**p- Value**	**Decision on Ho**	**Interpretation**
TLE Skills	-.095	.086	Failed to Reject	Not Significant

The results, as reflected in the hypothesis, were tested at a 0.05 level of significance. The overall *r-value of -.095 with a p-value of* .086 indicates that the null hypothesis fails to be rejected, suggesting no statistically significant relationship between TLE skills and pupils' performance (see Table 7). The data implied that the level of TLE skills and the performance of elementary pupils were not significantly correlated. No significant correlation was found, suggesting that these particular TLE skills may not have a substantial impact on the performance of pupils in the TLE subject. Although the skills are part of their performance, other factors may also affect the pupils' performance. According to Yusop et al. (2023), critical thinking was the intellectual mechanism to ensure the adequate performance of all tasks, goals, and functions. It should be mastered, as the knowledge and skills required are careful and keen critical thinking to handle all operations and transactions in the learning environment. In addition, McLeod (2025) proposed that human learning primarily occurs through social interactions and that interactions with individuals possessing more advanced skills or knowledge shape our cognitive abilities.

4.0 Conclusion

School leaders recognize that the grade six (6) elementary pupils, as well as TLE teachers, have current needs. Pupils can achieve an excellent level in their TLE skills and performance by providing a training program proposal for Grade six (6) pupils in elementary schools, outlining specific training activities for curriculum enhancement and skills development strategies to improve competencies in the program, particularly in different areas of Technology and Livelihood Education (TLE). This training program proposal, called ''Two-Day Home Economics, Industrial Arts, and ICT Skills Enhancement Training/Workshop for the Grade 6 Pupils'', aims to upgrade learners' skills in these areas and improve the technical learning environment to prepare pupils for future employment opportunities in the technological industries. School administrators can investigate additional training designed to assess the TLE skills and academic performance of elementary pupils. Likewise, with the assistance of specialists, teachers can also receive appropriate support and impart knowledge that will help them become adept in teaching the areas in TLE subjects. Hence, the pressure placed on teachers will be relieved by working with mentors who can help them improve their skills.

5.0 Contributions of Authors

The authors indicate equal contribution to each section. The authors reviewed and approved the final work.

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7.0 Conflict of Interests

The authors declare no conflicts of interest about the publication of this paper.

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