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Challenges of Limited Equipment and Tools in Technology and Livelihood Laboratories and its Educational Implication: Basis for an Action Plan

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***Abstract*: The main objective of this study is to explore the challenges associated with limited equipment and tools in Technology Livelihood Laboratories and examine its educational implications. It explores further to determine the limitations that technology and livelihood teachers encounter due to limited equipment and tools in baking and cooking laboratories. This study will also find the effect of limited equipment and tools in Technology Livelihood Laboratories in terms of student engagement and practical tests. The findings will be then utilized in creating an action plan. The participants of this study are twenty (20) Technology and Livelihood Education (TLE) teachers of President Corazon C. Aquino High School teaching cookery and bread and pastry production were utilized to answer the checklist questionnaire. The data were analyzed and interpreted using descriptive statistics. Mean, and verbal descriptions were used to conclude. The study concluded that in baking and cooking the lack of equipment, insufficient ingredients, and limited space have a significant impact in terms of limitations that teachers encounter in technology and livelihood laboratories. Limited physical resources and conditions (ingredients, space tools, and equipment) have a significant impact on student's engagement in baking and cooking. In terms of practical test, having complete tools and equipment in TLE laboratories would increase students' skills in cooking and baking. It also allows students to work quickly and produce good quality products.**

***Keywords*: Challenges, Limited, Tools and Equipment, TLE Laboratories, Technology and Livelihood Education (TLE).**

1. Introduction

Successful teaching and learning in practical disciplines such as Technology and Livelihood Education (TLE) rely on several critical components. These courses depend on the availability and use of good facilities, tools, and equipment. Under the Basic Education Curriculum (BEC) of 2002, TLE is incorporated into the Makabayan subject and considered as the laboratory of life or practice environment. Thus, TLE became one of the sources of practice environment for students in school. Technology and Livelihood Education plays a crucial role in the educational curriculum by imparting practical skills and knowledge in technology and vocational education. It is a skill-oriented field of study that is expected to equip learners with survival skills that make for self-reliance, employment, and paid employment. The technology livelihood laboratories serve as vital facilities where students can apply hands-on applications based on the theoretical knowledge acquired during classroom discussions. The skills acquired, such as baking and cooking, are not only valuable for immediate use but also contribute to the development of responsibility at home, for personal well-being and entrepreneurship.

Under Epitome of National Standard for Higher Education Section IV, the learning process in higher education should be interactive, holistic, integrative, scientific, contextual, thematic, effective, and collaborative. Learning activities requirements cannot be achieved without the ability of lecturers, the success of learning processes will also depend on adequate learning infrastructure, including laboratories.

The goals of the Technology and Livelihood Education under the K to 12 Basic Education Curriculum 2019, students should acquire knowledge skills through training in the TLE laboratory that are relevant to self-reliance. The laboratory is a vital place for secondary and senior school student's interpersonal and educational development. The technology livelihood laboratories are critical places for students' attainment of educational development. Therefore, laboratories should be given enough equipment, tools, and appropriate maintenance. In all, a good laboratory is essential for an effective practical, learning place. In other words, schools that do not satisfy requirements may be unable to provide a conducive environment for proper learning to occur.

However, there are challenges with Technology and Livelihood Education teachers and students such as the limited availability of tools and equipment in most public institutions like in cookery and bread and pastry production.

One of the main challenges is the delivery of high-quality education, which is often impeded by insufficient facilities, tools, and equipment that do not meet the necessary standards to support students studying TLE subjects (Gregorio, 2016). In certain schools, there are no designated Technology and Livelihood laboratories. Instead, what one commonly finds is an area labelled as TLE lab shared with the school canteen.

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There is no specific laboratory designated for bread and pastry, cooking, and sewing.

This fact collaborates with research carried out by Barcelona et al (2023) which showed various problems, challenges, and opportunities faced by teachers in the teaching of TLE. The identified problems revolve around human, pedagogical, and material aspects, including limited resources, practical activity constraints, and the financial backgrounds of students.

Such challenges present significant obstacles not only to students but also to teachers. Thus, this research aims to explore the challenges associated with limited equipment and tools in technology livelihood laboratories and examine their educational implications. By identifying the existing constraints and understanding their impact on students' learning outcomes and experiences, this study intends to lay the groundwork for an actionable plan aimed at enhancing the quality and effectiveness of technical education in these laboratories**.**

2. Statement of the Problem

This study will identify the challenges faced by technology and livelihood education (TLE) teachers due to limited equipment and tools in their laboratories and explore the educational implications of these challenges. The results will form the basis for an action plan. Specifically, it seeks to answer the following questions: [1] What are the limitations TLE teachers encounter in Technology and Livelihood Laboratories in terms of [1.1] Baking and [1.2] Cooking? [2] What is the effect of limited equipment and tools in Technology Livelihood Laboratories in terms of [2.1] Student Engagement [2.2] Practical Test? [3] How may the findings be utilized in creating an action plan?

3. Literature Review

According to Alarcon et.al (2024) to assess the effectiveness of the TVL Curriculum in terms of its extent of implementation and learning environment among 160 TVL students of Valencia City, Bukidnon, specifically in Valencia National High School, STI College – Valencia, and Paramount School of Arts, Languages, Management, and Sciences, Incorporated. It signifies that the students are satisfied with the availability of enhancement programs, equipment and facilities, references, and a conducive learning environment. The dimensions of the learning environment also scored 4.27, meaning that the students highly observed the facilities and resources, teaching and learning arrangements, and practical training periods.

Additionally, Haro, D. & Haro, G. (2022) stated that the manner of learning delivery, parental involvement, and LGU support were among the areas where secondary school instructors faced the most problems in the new normal. The majority of the 97 study participants, according to the findings, are younger, have served longer, yet have less education. In the new normal, secondary school instructors faced a moderate number of difficulties with the style of delivery of learning, parental participation, and support from the local government. Based on the style of delivery of learning and the engagement of parents, secondary school instructors, both younger and older, faced moderate problems.

Moreover, as stated by Yamon et. al (2022) claimed that because there has been little research on the methods of providing cooking instruction, this study aims to shed light on the real-world experiences of teachers who use blended learning to teach cooking. The Heideggerian phenomenological design and Van Kaam's seven-step Interpretative Phenomenological Analysis (IPA), which was made popular by Moustakas, were employed in this work. Before gathering the data, the researchers performed bracketing to avoid bias. The five participants were interviewed digitally using a semi-structured interview guide from the various public schools in Central Visayas District VII. The collected data were assessed, dissected, and appraised. This led to the sequential extraction of the following themes: (1) Instruction; (2) Learning Approach; and (3) Evaluation. The assessment of students' performance varies according on the type of learning mode they utilize. Nonetheless, educators remain positive in all situations and assess where they can most effectively instruct students, especially those pursuing technical majors. Furthermore, this study suggests holding symposiums and seminars with a focus on the mechanics of cooking instruction.

Also, Calubayan (2023) revealed in his study how students perceived video self-modeling as an interactive learning tool that improved their level of physical activity engagement as measured by their authentic engagement, strategic compliance, intellectual engagement, social engagement, and behavioral engagement. Other factors that were considered included acceptability, usability, functionality, frequency, and relevance. It was discovered that students like the video-self modeling because it is a user-friendly, content-rich, and engaging interactive tool for physical education classes. Additionally, students who use video modeling exhibit positive behavior, enhance their current skills, perform well in physical activities, are motivated, comprehend the material, and experience a boost in confidence and self-esteem. Finally, the use of video-self-modeling as an interactive tool has a significant impact on student engagement.

Additionally, as revealed by Orbeta (2023) to support and further expand this study for usage in the future, it is used to collect data about the students' current circumstances. It also covers the procedure for determining and analyzing the connection between Grade 9 students' performance in TLE computer system servicing and their engagement traits. A total of 225 respondents were involved in this study, divided into six sections: zinc, manganese, lead, zinc, zinc, zinc, and zirconium at Lutucan Integrated National High School. Frequency, mean, standard deviation, and Pearson r were used in the collection and processing of the data. According to the study's findings, students are paying attention, showing interest, and having hope for their success when it comes to TLE computer system service. The results showed that Grade 9 students' performance in TLE Computer System Servicing and their engagement attributes were significantly correlated.

Besides, Bragado (2023) unveiled a significant correlation between the Performance Tasks-Enriched Materials and the

student's level of proficiency in Practical Skills in Cookery 9, the Pearson-Product Moment Correlation was employed. Between 2022 and 2023, 35 Grade 9 - Cattleya students who were enrolled in Callejon National High School provided data via a survey questionnaire, performance task-enriched materials, and pretests and posttests. The results showed that, for the most part, the students in Cookery 9 were competent in their practical skills. In terms of performing mise en place, preparing a variety of sandwiches, presenting a variety of sandwiches, and storing sandwiches, they thought the performance task-enriched material was effective.

The results show that there is a significant correlation between their pre- and post-test results and their level of mastery as well as their perceived efficacy. These results suggest that students' practical skills were enhanced by performance task-enriched content in their performance tasks.

Furthermore, Jose et. al (2023) mentioned in the results of this study, which used interpretative Phenomenological Analysis, were as follows: Some college students still struggle with online learning. Online learning can be challenging, particularly for learners with little resources.

Lastly, according to Ubane et. Al (2023) on the study of variables influencing the University of Eastern Philippines system's college home economics students' performance in the basic food laboratory. The problem was described by the study using a descriptive-correlational research approach. Three (3) home economics faculty members handled the subject, seventy (70) students took up meal preparation and selection, and three (3) department heads participated in the study as respondents. This suggests that they lack access to advanced culinary techniques and equipment, are underexposed to expanding their knowledge and skill set, and may have a restricted budget for laboratory expenses. While completing laboratory tasks, respondents ran into issues. Nevertheless, students showed "moderate interest," "very good" knowledge, and "good skill," and faculty members were evaluated as "most competent" teachers.

As explained by Teke (2022) most significant issues with technical and vocational education provide a thorough explanation of how these issues arise from a lack of practical equipment in Bangladeshi technical and vocational institutions. Implementing empirical and practical activity in education and professions is the goal of technical and vocational education. A random sample of 270 respondents from technical and vocational schools in the Sirajganj district participated in the survey. Surveys were employed to gather information from instructors and students to evaluate the state of practical equipment in Bangladeshi technical and vocational education. The researcher concluded in this investigation that the issues found here are essentially widespread throughout Bangladesh and attempted to address each one. In conclusion, the researcher hopes that the relevant authorities will act appropriately to address the practical issues facing Bangladesh's technical and vocational institutes.

Also, in the study of Ramli et. Al (2019) revealed that the three factors—System Management (E-Learning, Management Information System); Learning Environment (Classrooms, Teaching Aid, Library); and Infrastructure (Hostels, Sports Facilities, Parking & Transportation)—can affect students' academic progress. 500 students from the 2016–17 academic year received data. With approximately 73% of the questions returned, a total of 364 usable and returned questionnaires were obtained.

The study's findings indicate that the following factors significantly impacted students' academic achievement: teaching aids, learning environment libraries, hostels, sports facilities, parking, and infrastructure transportation.

Nevertheless, Keswa (2022) focused on the effects that have been highlighted by the underfunding of physical education during its implementation in South African schools. The qualitative data technique will be used to manually address the study's findings. The study's conclusions will be that: potholes in the fields indicate that they are not properly maintained, and unexpected movements and other factors that could increase the risk of injury can be made worse by a lack of exercise equipment.

Moreover, Restiana, & Djukri,. (2021) declared that students' skills are improved when secondary schools have access to adequate laboratory equipment. Understanding the tools and resources available in the lab helps students learn in the setting. By assessing the students' familiarity with laboratory tools and supplies, the data were gathered.

The findings indicated that students had a high degree of proficiency with laboratory equipment, a strong understanding of how the equipment works, and a good understanding of how to use it.

Finally, as elaborated in the study of Sakuwunda, et. al (2023) difficulties associated with home economics instruction at Ebuom Municipal Assembly (M/A) Junior High School (JHS). A case study was used in the research. a sample size of nine, with three teachers and six students. The research tool that was used was the interview. The data was analyzed using qualitative methods including thematic data analysis. The results of the study showed that students' unfavorable contributions to the difficulties of teaching and studying home economics were exacerbated by the atmosphere of Ebuom M/A JHS. To make home economics lectures appealing, school administrators should create a welcoming environment in the classroom. The report suggests that to enhance home economics instruction in schools, the Ghana Education Service should give schools access to additional tools and equipment.

4. Theoretical/Conceptual Framework

Knowing the K to 12 curriculum standards allows the teachers to make their teaching contextualized. Before the start of the school year, unpacking competencies helps the teachers identify lessons and topics to be contextualized for better learning outcomes. Contextual Teaching and Learning (CTL) incorporates several existing theories, and it is based on sound pedagogical practices. Contextual teaching is all about helping learners make connections between the content they are learning and the context in which it will be used. Learners must first be made aware of how the work they are doing, depends on the skills that they already have. Vygotsky, as cited in

Hudson et.al., (2007, p. 54-58) refers to this as the "gap between what is known and what is being learned, the Zone of Proximal Development (ZPD)." Learners draw from previous experiences to give new meaning to what they are learning. Hudson and Whisler (2007, p.54-58) noted that the ideal connection process would be three-fold. Learners review what they already know related to the new concept; they learn about and practice the new concept; and they tie what they have learned to a real-life scenario. Contextual teaching helps to promote authentic learning and increases learners' success by allowing them to make connections as they construct new knowledge. In contextualized learning, learners use the new information they have learned and organize and combine it with information they already have so that it makes sense to them. Learners are active constructors of knowledge.

Chickering and Gamson, as cited in Hudson and Whisler, (2007, p. 54-58) emphasized that contextual learning should be an integrated learning process of problem-based learning and work-based learning to encourage and stimulate higher-level thinking. Active learning, or learning by doing as it is also called, divides active learning into three categories namely: action learning, situational learning, and incidental learning. Action learning is based on the premise that learning requires action and action requires learning. While in Situational learning knowledge and skills are taught in the context of how they will be used in real-world situations. Lastly, Incidental learning is based on the premise that learners will learn from their mistakes and/or learn from one another.

Furthermore, The Center for Occupational Research and Development (CORD) advocates a constructivist approach to teaching that incorporates five essential learner engagement strategies- the REACT strategy. REACT stands for Relating, Experiencing, Applying, Cooperating, and Transferring. The strategy allows the learners to learn, retain, and apply information. Teachers use REACT strategies to ensure the active participation of the learners. Teachers guide the learners to observe and record data, communicate effectively, build new skills, and finish the learning activity individually and as a group. The REACT strategies are designed to help learners build new skills and knowledge regardless of their starting point. A brief explanation of the strategy is presented below.

RELATING: *Learning in the context of life experience*—everyday sights, events, and conditions—allows learners to then relate those familiar situations to new information to be processed or problems to be solved.

EXPERIENCING: *Learning in the context of exploration, discovery, and invention*—is the heart of contextual learning. Hands-on activities and teacher explanations allow students to discover new knowledge.

APPLYING: *Learning by using new concepts and information in a useful context* allows learners to envision future success in careers and postsecondary education. Students apply their knowledge to real-world situations.

COOPERATING: *Learning in the context of sharing, responding, and communicating with others* is a primary instructional strategy in contextual teaching. Students solve problems as a team to reinforce knowledge and develop collaborative skills.

TRANSFERRING: *Learning in the context of existing knowledge, or transferring*, uses and builds upon what the learner already knows. Students take what they have learned and apply it to new situations and contexts.

The REACT strategy helps the teachers to easily identify activities that will suit the context of the learners. Teachers establish a teaching-learning environment where problem-based and work-based approaches work. The strategy allows learners to retain the knowledge and information of the lesson. Learners establish connections between what they learn and how that knowledge can be used. The strategy increases the motivation of the learners to a higher level (CORD, 2016).

As regards the relevance of these theories, employing technology and livelihood laboratories as one of the resources in supporting the learning process (a) can be used to facilitate a deeper understanding of the concepts taught and learning by doing, which enriches students' knowledge and skills to apply in real-life scenarios, and (b) allows learners to discover meaningful relationships between abstract ideas and real-world applications. Students are exposed to discovery learning, reinforcement and modeling, and problem-solving. Lastly, using (c) TLE laboratories will allow learners to establish connections between what they learn and how that knowledge can be used.

The fundamental research study aims to provide details concerning the challenges of limited equipment and tools in technology livelihood laboratories and its educational implications and the result will be used as a basis for an action plan. Below is the framework of the relation:

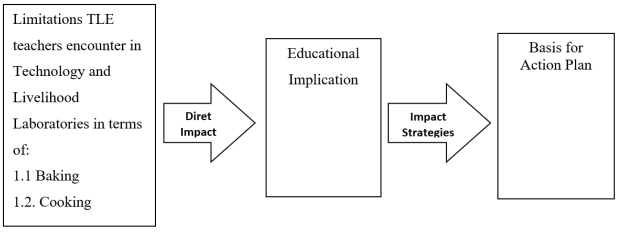

Fig. 1. Each arrow represents the influence or effect that one concept has on the next, illustrating a flow from the identification of challenges to the development of actionable strategies

5. Research Method

This study used a mix of qualitative and quantitative research design. Using a descriptive research approach, this study recognized the challenges of insufficient equipment and tools in technology livelihood laboratories, as well as the pedagogical implications, and the findings will be used to design an action plan.

The participants of this study are twenty (20) Technology and Livelihood Education (TLE) teachers at President Corazon C. Aquino High School teaching cookery and bread and pastry production. These teachers are Junior and Senior High School teachers.

The researcher used a basic survey questionnaire to collect data. It consists of four (4) sections.

Part 1: Baking Limitations in Technology and Livelihood

Laboratories

Part 2: Cooking Limitations in Technology and Livelihood Laboratories

Part 3: Impact of limited equipment and tools on student engagement

Part 4: Impact of limited equipment and tools in students' practical tests

The questionnaire is composed of twenty (5) items in each part with a total of 20 items. Moreover, it uses a Likert scale with 5 descriptive values. In the first and second part, the descriptive values are (1) Not a limitation, (2) Minor limitation, (3) moderate limitation, (4) Significant limitation, (5) severe limitation. The third part, the descriptive values are (1) significantly increasing engagement, (2) somewhat increase engagement, (3) no effect on engagement, (4) somewhat decreases engagement, and (5) significantly decreases engagement. The last part, the descriptive values are (1) significantly improve performance, (2) somewhat improves performance, (3) No-effect on performance, (4) somewhat decreases performance and (5) significantly decreases performance.

6. Presentation, Analysis and Interpretation of Data

The presentation, analysis, and interpretation of the data gathered by the researcher were tabulated and presented which were drawn from the twenty (20) respondents who are the selected faculty members of President Corazon C. Aquino High School and Division of Manila.

Table 1
The respondent's Teacher Level at President Corazon C. Aquino High School (N=20)

TEACHER LEVEL	FREQUENCY	PERCENTAGE %	RANK
TEACHER 1	13	65	I
TEACHER 11	1	5	3.5
TEACHER 111	5	25	2
MASTER TEACHER 1	1	5	3.5

Table 1 shows the Teacher level of President Corazon C. Aquino High School that participated in our research.

The table shows that most of the teachers (65%) fall under the TEACHER 1 level, which gathered 13 respondents. TEACHER 111 is the next most common level with 25%, showing a significant but smaller proportion. Both TEACHER 11 and MASTER TEACHER 1 have the smallest representation, each with 5% and one teacher respectively, sharing the rank of 3.5.

Table 2
Distribution of Years in Service

YEARS IN SERVICE	FREQUENCY	PERCENTAGE	RANK
0-3	7	35%	2
4-5	8	40%	1
6-10	1	5%	4.5
11-15	3	15%	3
15- above	1	5%	4.5

The table shows that 35% and 40% of the total teachers fall into the 0–3 and 4-5 years of service categories, respectively, most of the teaching workforce is younger and has fewer years of experience. The greatest frequency, which indicates a sizable proportion of teachers with moderate experience, is found in the 4-5-year range.

On the other hand, only one teacher, or 5% of the total, is assigned to the 6–10 years and 15 years and above categories, which share the lowest ranking. This implies that there aren't many educators with a significant number of years of experience or intermediate years.

The range of 11 to 15 years is in the middle, with 3 teachers accounting for 15% of the total, indicating a smaller but significant subset of more experienced educators.

Table 3
Baking Limitations in Technology and Livelihood Laboratories

STATEMENT	Weighted mean	Interpretation	Rank
1. **Lack of Equipment Question:** How does the lack of baking equipment (e.g., oven, electric mixer, baking pans, etc..) limit your ability to teach baking in the Technology and Livelihood Laboratories?	3.85	Significant Limitation	2
2. **Insufficient Ingredients Question:** How does a lack of baking ingredients (such as flour, sugar, oil, egg, baking powder, and yeast etc...) affect your baking classes in the Technology and Livelihood Laboratories?	3.85	Significant Limitation	2
3. **Limited Space Questions:** How does limited space in the Technology and Livelihood Laboratories limit your ability to teach baking classes effectively?	3.85	Significant Limitation	2
4. **Inadequate Training Question:** How does inadequate training (e.g., professional development, updated instructional method) limit your capacity to teach baking?	3.75	Significant Limitation	4
5. **Health and Safety Concerns:** How do health and safety concerns (e.g., maintaining hygiene standards, ensuring student safety), impact your ability to teach baking in the Technology and Livelihood laboratories?	3.5	Significant Limitation	5

The table under Baking Limitations in Technology and Livelihood Laboratories shows with weighted mean ranging from 3.5 to 3.85, all the problems identified are thought to be substantial barriers to properly teaching baking in the Technology and Livelihood Laboratories. The most important problems are thought to be the lack of equipment, insufficient ingredients, and limited space; they all share the second rank and have a high weighted mean of 3.85. Close behind, but scoring a little bit lower, is inadequate training. Despite their continued significance, health and safety concerns rank fifth and have the lowest weighted mean.

This distribution indicates that teachers encounter a variety of significant obstacles, the most urgent of which seem to be related to physical resources (equipment, ingredients, and space). Even though they are equally vital, safety and professional development are viewed as much less crucial in contrast.

The table 4 indicates that all listed challenges pose significant limitations to teaching baking effectively in the Technology and Livelihood Laboratories, with most having weighted means above 3.5. The lack of cooking ingredients is the most critical issue, followed by limited space and lack of equipment. Health and safety concerns, while significant, are ranked fourth.

Inadequate training is viewed as a moderate limitation and ranks fifth, suggesting it is the least pressing issue among those listed.

Table 4
Cooking Limitations in Technology and Livelihood Laboratories

STATEMENT	Weighted mean	Interpretation	Rank
1. **Lack of Equipment Question:** How does the lack of cooking equipment (e.g., stoves, pots, pans, etc..), affect your ability to teach cooking in the Technology and Livelihood Laboratories?	3.85	Significant Limitation	3
2. **Insufficient Ingredients Question:** How does a lack of cooking ingredients (e.g., vegetables, meat, spices, etc..) affect your cooking lessons in the Technology and Livelihood Laboratories?	4	Significant Limitation	1
3. **Limited Space Questions:** How does limited space in the Technology and Livelihood Laboratories limit your ability to teach baking classes effectively?	3.95	Significant Limitation	2
4. **Inadequate Training Question:** How does inadequate training (e.g., professional development, updated instructional method) limit your capacity to teach baking?	3.45	Moderate Limitation	5
5. **Health and Safety Concerns:** How do health and safety concerns (e.g., maintaining hygiene standards, ensuring student safety), impact your ability to teach cooking in the Technology and Livelihood Laboratories?	3.6	Significant Limitation	4

This distribution highlights that physical resources and conditions (ingredients, space, and equipment) are the primary concerns for teachers, significantly impacting their ability to teach baking. Health and safety, though important, and professional development, while necessary, are seen as slightly less critical in comparison.

Table 5
Impact of Limited Tools and Equipment on Student's Engagements

STATEMENT	Weighted mean	Interpretation	Rank
1. **Lack of tools and equipment can hinder the ability of students to effectively carry out tasks.**	4.48	Somewhat affect performance	1.5
2. **The absence of proper tools and equipment may limit students' understanding of cooking and baking concepts.**	4.38	Somewhat affect performance	3.5
3. **Insufficient cooking and baking equipment has hindered student enthusiasm in performing their laboratory task.**	4.48	Somewhat affect performance	1.5
4. **Incomplete tools and equipment consume more time in performing tasks.**	4.38	Somewhat affect performance	3.5
5. **The school's lack of equipment impedes students' academic performance.**	4.29	Somewhat affect performance	5

Based on the table of all responses, the absence of tools and equipment "somewhat affects performance," with weighted means varying from 4.29 to 4.48. The assertions that received the highest ranking, which were tied with a weighted mean of 4.48, demonstrate that students' excitement and task performance are greatly impeded by inadequate tools and equipment.

Lack of appropriate instruments also restricts comprehension and increases time consumption; both share the third rank with a weighted mean of 4.38. The absence of equipment hinders overall academic achievement, although, with a weighted mean of 4.29 and ranking fifth, it is not as serious as the other problems.

This distribution makes clear that students' performance in cooking and baking lessons is greatly impacted by a lack of appropriate tools and equipment, especially when it comes to job execution and sustaining enthusiasm. Academic performance is significantly influenced, along with comprehension of topics and time management.

Table 6
Impact of Limited Tools and Equipment on Student's Practical Test

STATEMENT	Weighted mean	Interpretation	Rank
1. **Having complete equipment in the TLE laboratory would increase students' skills in cooking and baking.**	4.90	Somewhat affect performance	1.5
2. **Having all the necessary tools and equipment at the TLE laboratory will allow students to work quickly and produce good-quality results.**	4.90	Somewhat affect performance	1.5
3. **Students prefer to learn by experiencing the lesson rather than watching and listening.**	4.81	Somewhat improves performance	4.5
4. **Students gain confidence and enhance their skills using the entire range of laboratory equipment.**	4.86	Somewhat affect performance	3
5. **The real-world application allows students to apply their knowledge to realistic settings, which leads to a better understanding of the subject matter.**	4.81	Somewhat affect performance	4.5

Based on the table all statements suggest that having complete tools and equipment in TLE laboratories significantly affects or improves students' performance, with weighted means ranging from 4.81 to 4.90. The highest-ranked statements, with a weighted mean of 4.90, emphasize the critical importance of complete equipment for skill development and efficiency. Access to a full range of equipment boosts confidence and skill enhancement, ranking third. Experiential learning and real-world application, though slightly lower in ranking, also significantly enhance students' performance and understanding, with a weighted means of 4.81.

This distribution highlights that comprehensive tools and equipment in TLE laboratories are vital for improving students' practical skills, efficiency, confidence, and overall understanding of the subject matter through hands-on and real-world applications.

Table 7
Limitations in Technology and Livelihood Laboratories

TERMS	Weighted mean	Interpretation	Significant Difference
1. **BAKING.**	3.76	Moderate Limitation	0.01
2. **COOKING**	3.77	Moderate Limitation	

The table indicates that the evaluation of "BAKING" with a weighted mean of 3.76 shows that it is perceived as a moderate limitation in the context of Technology and Livelihood Education (TLE) laboratories. This suggests that there are some challenges or constraints associated with baking that affect its implementation or teaching effectiveness. The significant difference of 0.01 implies that the respondents consistently rated baking as a moderate limitation, and even minor variations in perception were found to be statistically significant.

This assessment highlights the need to address specific issues related to baking in TLE laboratories to improve the

effectiveness of teaching and learning in this area.

Table 8
Effect of limited equipment and tools in Technology and Livelihood Laboratories

TERMS	Weighted mean	Interpretation	Significant Difference
1. STUDENT ENGAGEMENT	4.4	Somewhat affect performance	0.46
2. PRACTICAL TEST	4.86	Somewhat affect performance	

The table shows that student engagement is thought to have a rather significant impact on performance, with a weighted mean of 4.4. The statistically significant difference of 0.46 suggests that respondents' perceptions of its impact vary. This diversity implies that, although student participation matters, its impact on performance can vary depending on the situation or the experiences of certain students.

Practical Test: Based on a weighted mean of 4.86, it can be concluded that practical tests have a moderately substantial effect on performance. The high score emphasizes how important practical exams are to the learning process, even though the meaning "somewhat affect performance" implies that this is not a severe restriction. The consistency of judgments about practical testing is rather unclear due to the absence of a substantial difference value being supplied.

In conclusion, it is believed that both student participation and practical exams have some bearing on performance, with practical exams having a marginally greater effect. While practical assessments are typically viewed as significant but not overly restricting determinants in performance, opinions of student participation vary, suggesting that different people have different experiences with or perspectives on its significance.

7. Conclusion

The analysis reveals several important insights regarding the problems and conditions of instruction in Technology and Livelihood Education (TLE) laboratories. With most having 0–5 years of experience, most faculty members are at the TEACHER 1 level, suggesting that they are in the early phases of their careers. This emphasizes how important professional growth and mentoring are. The absence of necessary supplies, inadequate amount of ingredients, and restricted areas in TLE laboratories pose the biggest obstacles to efficient instruction. These are pressing problems that require prompt resolution. The lack of proper training and health and safety issues are serious, but they are seen as less urgent than the scarcity of physical resources.

The analysis reveals several significant insights into the issues and circumstances surrounding instruction in Technology and Livelihood Education (TLE) laboratories. Most faculty members are at the TEACHER 1 level, indicating that they are still in the early stages of their profession, with the majority having 0–5 years of experience. This highlights the significance of mentoring and professional development. The largest barriers to effective instruction in TLE laboratories are the lack of required supplies, insufficient number of materials, and little space. These are urgent issues that need to be resolved right away. Although health and safety concerns and inadequate training are critical, they are not given the same urgency as the absence of physical resources.

8. Recommendation

Several recommendations are made to improve the TLE educational experience and overcome these constraints. First and foremost, it is critical to improve resources and equipment by making the necessary purchases of baking and cooking supplies and equipment and ensuring that TLE laboratories have enough room for safe and comfortable student housing. Secondly, it is important to offer teachers ongoing professional development opportunities to improve teaching strategies and keep up with safety regulations.

To increase student engagement and comprehension, practical learning should also be prioritized in TLE education. This can be achieved by incorporating practical examinations seamlessly into the curriculum and highlighting their beneficial effects. To maintain high hygiene standards and guarantee student safety, it is crucial to address health and safety concerns by putting strict health and safety measures into place in TLE laboratories. By putting these suggestions into practice, President Corazon C. Aquino High School and the Division of Manila's TLE program will be far more effective, improving academic results and raising student involvement and performance.

In terms of further research: TLE Class Equipment Requirements: Inventories Based on Experiments; The Influence of TLE Teaching Strategies on Students' Behavior and Skill Sets in Baking and Cooking; The Junior High School's Academic Achievement in TLE Skills and Knowledge Indicators; A Correlational Analysis of the Laboratory and Lecture Approaches to TLE Instruction; Alternative strategies are schools employing to cope with the lack of equipment and tools.

9. Action Plan

To enhance the Technology and Livelihood Education (TLE) program at President Corazon C. Aquino High School and the Division of Manila by improving resources, equipment, teaching strategies, practical learning, and health and safety measures to boost student engagement, performance, and academic results.

A. Resource and Equipment Enhancement

1) Action Steps

1. Conduct an inventory assessment of current TLE equipment and identify gaps.
2. Develop a detailed list of required baking and cooking supplies and equipment.
3. Allocate the budget and seek additional funding from local government, private sector partnerships, and grants.
4. Purchase the necessary equipment and supplies.
5. Ensure adequate space in TLE laboratories for safe and comfortable student activities by rearranging the layout or expanding facilities if necessary.

2) Responsible Parties:
- TLE Department Head
- School Administration
- Local Government Units (LGUs)
- Private Sector Partners

3) Timeline:
- Inventory and assessment: Month 1
- Budget allocation and funding: Month 2
- Purchasing and installation: Months 3-4

B. Professional Development for Teachers

1) Action Steps
1. Identify professional development needs and areas for improvement in teaching strategies and safety regulations.
2. Partner with educational institutions and professional organizations to provide training sessions and workshops.
3. Schedule regular professional development opportunities (e.g., quarterly workshops, annual seminars).
4. Implement a system for continuous feedback and improvement based on teacher evaluations and performance.

2) Responsible Parties
- TLE Department Head
- School Administration
- Professional Development Coordinators
- External Training Providers

3) Timeline
- Needs assessment: Month 1
- Partnering with training providers: Month 2
- Initial training sessions: Months 3-4
- Ongoing professional development: Continuous

C. Prioritizing Practical Learning

1) Action Steps
1. Integrate practical examinations seamlessly into the TLE curriculum.
2. Develop a rubric to assess practical examinations and communicate their importance to students.
3. Allocate specific times within the school year for practical exams.
4. Monitor and evaluate the impact of practical exams on student engagement and comprehension.

2) Responsible Parties
- TLE Teachers
- Curriculum Development Team
- School Administration

3) Timeline
- Curriculum integration: Month 2
- Development of assessment rubrics: Month 3
- Implementation of practical exams: Month 4 onwards

D. Health and Safety Measures

1) Action Steps
1. Conduct a risk assessment of current TLE laboratory conditions.
2. Develop and implement comprehensive health and safety protocols.
3. Ensure all equipment meets safety standards and is regularly maintained.
4. Provide training for students and staff on health and safety practices.
5. Conduct regular inspections and audits of TLE laboratories to ensure compliance with safety standards.

2) Responsible Parties
- TLE Department Head
- School Safety Officer
- Maintenance Staff

3) Timeline
- Risk assessment: Month 1
- Development of safety protocols: Month 2
- Training and implementation: Month 3
- Ongoing inspections and audits: Continuous

E. Monitoring and Evaluation

1) Action Steps
1. Establish a monitoring and evaluation committee to oversee the implementation of the action plan.
2. Set clear, measurable objectives and key performance indicators (KPIs) for each action step.
3. Conduct periodic reviews and gather feedback from students, teachers, and stakeholders.
4. Adjust the action plan as needed based on evaluation findings.

2) Responsible Parties:
- Monitoring and Evaluation Committee
- School Administration
- TLE Department Head

3) Timeline
- Establishment of committee: Month 1
- Setting objectives and KPIs: Month 2
- Periodic reviews: Every 6 months
- Feedback gathering and adjustments: Continuous

4) Expected Outcomes
- Improved quality and availability of TLE resources and equipment.
- Enhanced teacher competencies and teaching strategies.
- Increased student engagement and comprehension through practical learning.
- Higher health and safety standards in TLE laboratories.
- Improved student performance and academic results in TLE.

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