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INDEPENDENT COOPERATIVE LEARNING (ICL) AS A STRATEGY FOR IMPROVING TECHNOLOGY AND LIVELIHOOD EDUCATION (TLE) SKILLS IN SECONDARY LEARNERS: BASIS FOR A PROPOSED LEARNING ACTIVITY KIT

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Abstract

This study aimed to assess the use of Independent Cooperative Learning (ICL) strategy in enhancing the Technology and Livelihood Education (TLE) competencies of the Grade 9 learners with end view of proposing a learning activity kit based on the findings. Findings revealed that the current state of TLE competencies among Grade 9 learners demonstrates a moderate level of proficiency across technical skills, problem-solving abilities, and creativity, with strengths observed in willingness to try new things and explore different possibilities, area for improvement include enhancing problem-solving skills, particularly in identifying and defining problems, and further developing creative thinking within the context of TLE projects.

Moreover, the Grade 9 learners demonstrated a high level of skill performance in TLE with majority achieving very satisfactory indicating effective teaching, student engagement, and a conducive learning environment, the strong positive correlations between technical skills with skill performance in TLE demonstrate that these skills are not merely byproducts of successful TLE education, but rather foundational pillars of student achievement within the subject, and the proposed learning activity kit aims to enhance student learning by incorporating ICL strategies, fostering teamwork, communication, and problem-solving while developing essential technical skills in the TLE classroom.

Recommendations included that of school administrators may prioritize the development of core technical skills through hands-on training, emphasizing precision, and ensuring safe and effective use of tools and equipment, and future researchers may validate the proposed learning activity kit crafted by the proponent in order to require students to identify, define, and solve complex problems, developing critical thinking and problem-solving skills among others.

***Keywords**: Independent Cooperative Learning (ICL), TLE teaching and learning, proposed learning activity kit*

Introduction

Independent Cooperative Learning (ICL) is a pedagogical approach that combines the elements of independent study and cooperative learning. This strategy encourages students to work both individually and collaboratively, fostering a balance between personal responsibility and teamwork. In the context of Technology and Livelihood Education (TLE), ICL can be a powerful tool for enhancing students' skills and competencies.

TLE, as a subject that bridges academic knowledge with practical application, requires students to develop a wide range of abilities, including technical proficiency, problem-solving skills, creativity, and critical thinking. Independent Cooperative Learning can effectively address these needs by providing students with opportunities to explore TLE

concepts independently while also benefiting from the diverse perspectives and collective knowledge of their peers.

While ICL has shown promise in various educational settings, its application in the context of TLE has not been extensively studied. There is a gap in the literature regarding the specific impact of ICL on students' TLE competencies, particularly in terms of technical skills, problem-solving abilities, and creative output. This research aims to fill this gap by investigating the effectiveness of ICL in improving TLE skills among secondary students.

Methods

This chapter presents the research methodology of the study such as research design, population, samples and sampling technique, research instrument validity and reliability tests, data gathering procedures, and statistical treatment.

Research Design

This study used the descriptive quantitative research design which is appropriate to the aims of the study. Descriptive research is a type of research that aims to describe characteristics, frequencies, and relationships of a population or phenomenon. It is often used to answer questions about what, when, where, and how but not why. This type of research involves observing and collecting data without manipulating variables, providing detailed and accurate picture of the phenomenon being studied.

Population, Samples and Sampling Technique

This research involved 98 public secondary TLE teachers which is the population relevant to the context of the study. This was entire TLE teachers of the public school in the sub-office. Furthermore, through random sampling using Slovin's formula, the present study was able to have 79 public secondary TLE teachers to represent the entire population of 98 TLE teachers with a margin of error of five percent.

The Slovin's formula is:

n=sample size
N=population size (98)
e=margin of error (0.05)

Research Instrument

A research instrument is a tool or technique to be used to collect data for this study. It is a method through which information will be gathered from the participants. Preparing a well-designed research instrument is essential for collecting accurate and reliable data that can be used to answer the research questions.

This study used a researcher-based survey questionnaire that focused on the variables on the current state of TLE competencies among Grade 9 learners in terms of technical skills, problem solving abilities, and creativity.

Validity Test. It is the process of ensuring that a research instrument measures what it is intended to measure. Expert review was done to ensure the validity of the items in the questionnaire. This was through the validation of the research adviser, school head, and master teacher of the area of Technical and Livelihood Education (TLE). One-sample t-test was used to find out the validity test of the questionnaire items.

Reliability Test. It is the process of assessing the consistency and dependability of the research instrument. It made the items in the questionnaire produce consistent results over time and across different settings or samples. In order to test the reliability of the research instrument constructed by the researcher, a group of TLE teachers who were not part of the study as respondents, were asked to response in a pilot testing activity. Thus, this ensured the reliability of the instrument making it able to produce consistent results over time and across different settings or samples. In

this, Cronbach alpha test was used and this resulted to 0.83 which mean reliable items.

Data Gathering Procedures

In order to gather the pertinent data needed to complete the study, the researcher sought approval from relevant authorities who are the public schools district supervisor, and the school heads of the public secondary schools whose TLE teachers were part of the study. At the same time, the researcher ensured compliance with ethical guidelines and regulations.

The researcher also identified and recruited participants who met the inclusion criteria of the study, which is Grade 9 TLE teachers using ICL. Then, informed consent from participants, explaining the purpose, procedures and potential risks of the research was obtained. The researcher had the respondents answer the questionnaire. Accurate and ethical data collection was ensured.

Statistical Treatment

The following are the statistical treatment used to the data gathered.

Frequency. It is a method that will be used to analyze and summarize categorical data. It involves counting the numbers of times each category or value occurs in a dataset.

Mean. It is a statistical method used to calculate the average value of a set of numbers. It is often referred to as simply the average. It is was used to answer problem statement numbers one (1), and two (2).

The formula used:

$$\text{Mean} = \frac{\text{(sum of all values)}}{\text{(number of values)}}$$

Pearson Correlation Coefficient (Pearson's r). It is a statistical measure that quantifies the strength and direction of the linear relationships between two variables. It ranges from -1 to 1 which -1 is perfect negative correlation, 0 is no correlation, and 1 is perfect positive correlation. It will answer problem statement number three (3).

The formula to be used is:

$$r = \Sigma[(x_i - \bar{x})(y_i - \bar{y})] / \sqrt{[\Sigma(x_i - \bar{x})^2 * \Sigma(y_i - \bar{y})^2]}$$

where:

- x_i and y_i are the individual data points for the two variables.
- $\bar{x}$ and $\bar{y}$ are the means of the respective variables.
- Σ is the summation symbol.

Results

Table 1.1
Current State of TLE Competencies among Grade 9 Learners in terms of Technical Skills

Current State of TLE Competencies among Grade 9 Learners in terms of Technical Skills	Mean	Verbal Interpretation	Rank
The Grade 9 learner...			
1.1 demonstrates proper handling techniques of tools and equipment.	2.91	Moderate Extent	4
1.2 follows safety guidelines.	2.73	Moderate Extent	6
1.3 properly cares for and maintains tools and equipment according to their intended purpose and instructions.	3.09	Moderate Extent	1
1.4 produces work that meets the required standards of accuracy and precision.	3.00	Moderate Extent	2
1.5 demonstrates skills in using tools and equipment to achieve precise measurements and outcomes.	2.75	Moderate Extent	5
1.6 uses tools and equipment effectively to complete tasks in a timely manner.	2.94	Moderate Extent	3
1.7 plans and organizes work to avoid delays or inefficiencies.	2.55	Moderate Extent	10
1.8 recognizes and resolves problems related to tools and equipment.	2.64	Moderate Extent	9
1.9 diagnoses and repairs equipment malfunctions when possible.	2.70	Moderate Extent	7
1.10 effectively uses a variety of tools and equipment, even if unfamiliar.	2.68	Moderate Extent	8
COMPOSITE MEAN	**2.79**	**Moderate Extent**	

Table 1.2
Current State of TLE Competencies among Grade 9 Learners in terms of Problem-Solving Skills

Current State of TLE Competencies among Grade 9 Learners in terms of Problem-Solving Skills	Mean	Verbal Interpretation	Rank
The Grade 9 learner...			
2.1 identifies problems or challenges that arise in TLE projects or tasks.	3.20	Moderate Extent	6
2.2 breaks down complex problems into smaller, more manageable components.	3.55	High Extent	2
2.3 collect relevant information to understand and solve problems.	2.91	Moderate Extent	8
2.4 creates effective plans or strategies to address problems.	2.73	Moderate Extent	9
2.5 set clear and achievable goals for problem-solving.	3.64	High Extent	1
2.6 prioritizes tasks to ensure efficient problem-solving.	2.60	Moderate Extent	10
2.7 effectively carries out problem-solving strategies.	2.95	Moderate Extent	7
2.8 modifies strategies if they are not working effectively.	3.27	Moderate Extent	5
2.9 assesses the effectiveness of solutions and identifies any shortcomings.	3.43	Moderate Extent	4
2.10 analyzes the problem-solving process to learn from experiences.	3.51	High Extent	3
COMPOSITE MEAN	**3.17**	**Moderate Extent**	

Table 1.3
Current State of TLE Competencies among Grade 9 Learners in terms of Creativity

Current State of TLE Competencies among Grade 9 Learners in terms of Creativity	Mean	Verbal Interpretation	Rank
The Grade 9 learner...			
3.1 comes up with original and innovative solutions to TLE challenges.	3.44	Moderate Extent	3
3.2 thinks creatively and explores unconventional approaches.	3.11	Moderate Extent	6
3.3 creates novel ways of completing TLE tasks.	3.56	High Extent	2
3.4 adjusts plans or approaches to accommodate new information or challenges.	2.78	Moderate Extent	9
3.5 is willing to try new things and explore different possibilities.	3.78	High Extent	1
3.6 considers multiple perspectives and approaches.	2.90	Moderate Extent	7
3.7 is not afraid to try new things, even if they fail.	2.89	Moderate Extent	8
3.8 overcomes obstacles and continues to work towards their goals.	2.50	Moderate Extent	10
3.9 recognizes that mistakes can be valuable learning experiences.	3.20	Moderate Extent	5
3.10 is willing to consider alternative perspectives.	3.30	Moderate Extent	4
COMPOSITE MEAN	**3.14**	**Moderate Extent**	

Table 2
Skill Performance of the Grade 9 Learners in TLE

Skill Performance in TLE	F	%
90 -100 (Outstanding)	86	24.57
85 - 89 (Very Satisfactory)	145	41.42
80-84 (Satisfactory)	101	28.85
75-79 (Fairly Satisfactory)	18	5.16
Below 75 (Did Not Meet Expectations)	0	0
Total	350	100.00
Mean	85.40 (Very Satisfactory)	

Table 3
Significant Relationship Between the Current State of TLE Competencies among Grade 9 Learners and their Skill Performance in the said Subject

Source of Variations		r-value	Verbal Interpretation	p-value	Conclusion
Technical Skills	Skill Performance	.725	Strong positive relationship	0.01	Significant
Problem Solving Abilities		.652	Strong positive relationship	0.01	Significant
Creativity		.302	Weak positive relationship	.0.01	Significant

Proposed Learning Activity Kit
Focus: Technical Skills
Skill: Enhancing Problem-Solving Skills and Creativity in Food and Beverage Services
Kit Components:

- **Core Materials:**
  - **Basic Culinary Tools:** A set of essential cooking utensils (knives, measuring cups and spoons, spatulas, whisks), a cutting board, a chef's knife sharpener, and a selection of pots and pans.
  - **Ingredients:** A variety of basic ingredients (e.g., flour, sugar, eggs, vegetables, fruits, spices) for a range of culinary projects.
  - **Instructional Manuals:** Comprehensive manuals with clear instructions, diagrams, and safety guidelines for using equipment and preparing basic dishes.
  - **Project Cards:** A set of project cards with varying levels of difficulty, each outlining a specific culinary project with clear objectives and success criteria.
- **ICL Components:**
  - **Role Cards:** Cards defining specific roles within each group (e.g., Project Manager, Researcher, Materials Manager, Quality Control Officer).
  - **Collaboration Tools:** Whiteboards or flip charts, markers, sticky notes, and a designated area for group discussions.
  - **Peer Assessment Rubrics:** Rubrics that assess individual contributions to group projects, including teamwork, communication, and problem-solving skills.

ICL Strategies:

- **Group Projects:** Students work in small groups to complete assigned culinary projects.
- **Role Assignment:** Each group member is assigned a specific role with clear responsibilities (e.g., researching recipes, gathering ingredients, preparing specific components of the dish).
- **Peer Teaching and Learning:** Group members share their knowledge, skills, and insights with each other.
- **Constructive Feedback:** Students provide constructive feedback to their group members on their contributions and performance.
- **Group Presentations:** Groups present their finished projects to the class, explaining the process, challenges faced, and solutions implemented.

Activities:

- **"Culinary Creations"**: Groups are assigned a theme (e.g., "Healthy Snacks," "Regional Cuisine") and challenged to create a unique dish within that theme.

- **"Troubleshooting Challenge"**: Groups are presented with a culinary challenge (e.g., a recipe that is not working as expected) and must work together to identify and solve the problem.
- **"Recipe Innovation"**: Groups are tasked with modifying a classic recipe to create a healthier or more creative version.

Assessment:

- **Individual Assessments:** Assess individual student learning through observations, quizzes, and individual assignments.
- **Group Assessments:** Assess group projects based on the quality of the final product, the effectiveness of teamwork, and individual contributions.
- **Peer and Self-Assessment:** Encourage students to engage in peer and self-assessment to reflect on their own learning and the effectiveness of their group work.

LEARNING ACTIVITY KIT 2

Focus: Problem Solving Abilities

Skill: This activity kit integrates ICL principles to foster teamwork, communication, and problem-solving skills while providing students with hands-on experience in sustainable gardening practices.

Title: "Green Thumbs Up: A Sustainable Gardening Project"

Focus: Horticulture/Agriculture TLE Track

Objective: To enhance students' understanding of sustainable gardening practices while fostering teamwork, communication, and problem-solving skills through ICL.

Kit Components:

- **Core Materials:**
  - **Gardening Tools:** Basic gardening tools (shovels, rakes, trowels, watering cans, pruning shears), seeds (various vegetables/herbs), potting mix, plant markers, and gardening gloves.
  - **Sustainable Resources:** Compost bin, vermicomposting kit (optional), recycled containers for planting (e.g., plastic bottles, old tires).
  - **Reference Materials:** Books, pamphlets, or online resources on organic gardening, composting, and plant care.
- **ICL Components:**
  - **Role Cards:**
    - **Project Manager:** Oversees project timelines, ensures tasks are completed, and facilitates group discussions.
    - **Research & Development:** Researches the best planting methods, soil requirements, and pest control techniques for selected plants.
    - **Materials Manager:** Responsible for sourcing and organizing materials, ensuring proper tool maintenance, and maintaining a clean and organized workspace.
    - **Grower:** Responsible for planting, watering, and caring for the plants.
    - **Documentarian:** Documents the project progress through photos, videos, journals, and presentations.
  - **Collaboration Tools:** Whiteboard, markers, measuring tapes, rulers, and a designated area for group discussions and project planning.
  - **Peer Assessment Rubrics:** Rubrics to assess individual and group contributions, teamwork, communication, and the quality of the final project.

Activities:

- **Project Planning:** Groups brainstorm and plan their garden project, considering factors like plant selection, space utilization, and resource allocation.
- **Garden Establishment:** Groups work together to prepare the garden bed, plant seeds/seedlings, and set up a watering system.
- **Plant Care and Maintenance:** Groups are responsible for the ongoing care of their garden, including watering, weeding, fertilizing (using organic methods), and pest control.
- **Data Collection and Analysis:** Groups collect data on plant growth, observe and document

plant health, and analyze the effectiveness of their gardening practices.

- **Project Presentation:** Groups present their project to the class, showcasing their garden, sharing their experiences, and presenting their findings.

Assessment:

- **Individual Assessments:** Assess individual student contributions based on their role responsibilities, participation in group discussions, and the quality of their individual work.
- **Group Assessments:** Assess group projects based on the quality of the garden, the effectiveness of teamwork, and the presentation of findings.
- **Self-Assessment:** Encourage students to reflect on their own learning, their contributions to the group, and the challenges they faced.

LEARNING ACTIVITY KIT 3

Focus: Creativity

Skill: Being creative in TLE skills

This activity kit integrates ICL principles to foster creativity, teamwork, and problem-solving skills while providing students with hands-on experience in upcycling and sustainable fashion design.

Title: "Eco-Friendly Fashion: Upcycling and Redesign"

Focus: Home Economics/Fashion Design TLE Track

Objective: To enhance students' creativity, problem-solving skills, and environmental awareness through an upcycling project.

Kit Components:

- **Core Materials:**
  - **Assorted Fabrics and Textiles:** A variety of discarded or unwanted fabrics (old clothes, curtains, upholstery), ribbons, buttons, zippers, and other embellishments.
  - **Basic Sewing Supplies:** Sewing machine(s), needles, thread, scissors, measuring tape.
  - **Creative Tools:** Fabric paints, markers, stencils, glue, and other decorative materials.
- **ICL Components:**
  - **Role Cards:**
    - **Designer:** Responsible for the creative design and concept of the upcycled item.
    - **Fabric Specialist:** Selects and prepares the fabric for use (washing, cutting, etc.).
    - **Construction Specialist:** Focuses on the sewing and construction of the upcycled item.
    - **Marketing & Presentation:** Develops a marketing strategy and prepares a presentation for the final product.
  - **Collaboration Tools:**
    - Mood boards (for collecting inspiration and design ideas)
    - Design sketches and templates
    - Presentation slides or digital portfolios
  - **Peer Assessment Rubrics:** Rubrics to assess individual and group contributions, creativity, teamwork, and the quality of the final product.

Activities:

1. **Brainstorming and Design:** Groups brainstorm ideas for upcycling projects (e.g., transforming old t-shirts into tote bags, creating new garments from discarded clothing, designing unique accessories).
2. **Research and Planning:** Groups research upcycling techniques, gather inspiration from online resources and fashion magazines, and develop detailed design plans.
3. **Material Selection and Preparation:** Groups select and prepare the necessary fabrics and materials, considering factors like color, texture, and durability.
4. **Construction and Creation:** Groups work together to create their upcycled items, following their design plans and applying their sewing and design skills.
5. **Presentation and Evaluation:** Groups present their final projects to the class, explaining their

design process, challenges faced, and the sustainability aspects of their creations.

Assessment:

- **Individual Assessments:** Assess individual student contributions based on their role responsibilities, participation in group discussions, and the quality of their individual work.
- **Group Assessments:** Assess group projects based on creativity, originality, quality of craftsmanship, effective teamwork, and the presentation of the final product.
- **Self-Assessment:** Encourage students to reflect on their own learning, their contributions to the group, and the challenges they faced.

LEARNING ACTIVITY KIT 4

Focus: Technical Skills

Skill: Communication and Teamwork

This activity kit integrates ICL principles to foster teamwork, communication, problem-solving skills, and creativity while providing students with hands-on experience in basic electronics.

Title: "Technovation: Designing and Prototyping a Simple Electronic Circuit"

Focus: ICT/Electronics TLE Track

Objective: To enhance students' understanding of basic electronics principles, develop their problem-solving, critical thinking, and teamwork skills through a hands-on electronics project.

Kit Components:

- **Core Materials:**
  - **Basic Electronics Components:** Resistors, capacitors, LEDs, batteries, breadboards, jumper wires, switches.
  - **Electronic Measuring Tools:** Multimeter (optional), digital voltmeter.
  - **Construction Materials:** Cardboard, paper clips, popsicle sticks, other recyclable materials for creating prototypes.
- **ICL Components:**
  - **Role Cards:**
    - **Circuit Designer:** Responsible for designing the electronic circuit diagram.
    - **Component Specialist:** Researches and selects the appropriate electronic components.
    - **Builder:** Assembles the circuit on the breadboard.
    - **Tester:** Tests the circuit, troubleshoots problems, and ensures its functionality.
    - **Documentation Specialist:** Documents the design process, records observations, and prepares a presentation.
  - **Collaboration Tools:**
    - Circuit simulation software (optional)
    - Design templates and worksheets
    - Presentation slides or digital portfolios
  - **Peer Assessment Rubrics:** Rubrics to assess individual and group contributions, teamwork, problem-solving skills, and the quality of the final project.

Activities:

1. **Brainstorming and Design:** Groups brainstorm and design a simple electronic circuit (e.g., a simple LED circuit, a buzzer alarm, a basic logic gate).
2. **Circuit Design and Simulation:** Groups use circuit simulation software (if available) to design and test their circuits virtually before building the physical prototypes.
3. **Circuit Construction:** Groups assemble their circuits on the breadboard, following the design and troubleshooting any issues that arise.
4. **Testing and Refinement:** Groups test their circuits thoroughly, identify and troubleshoot any problems, and make necessary adjustments to the design.
5. **Presentation and Documentation:** Groups present their final projects to the class, explaining their design process, demonstrating the functionality of their circuits, and documenting their findings.

Assessment:

- **Individual Assessments:** Assess individual student contributions based on their role responsibilities, participation in group

discussions, and their understanding of basic electronics concepts.

- **Group Assessments:** Assess group projects based on the functionality of the circuit, the effectiveness of teamwork, the quality of the presentation, and the overall design and creativity of the project.
- **Self-Assessment:** Encourage students to reflect on their learning, their contributions to the group, and the challenges they faced during the project.

LEARNING ACTIVITY KIT 5

Focus: Problem Solving Abilities
Skill: Being creative in solving problems

This activity kit integrates ICL principles to foster teamwork, communication, problem-solving skills, and civic engagement while providing students with valuable real-world learning experiences.

Title: "Community Impact: Designing and Implementing a Local Community Project"

Focus: Any TLE track (e.g., Agri-Fishery Arts, Home Economics, ICT/Electronics)

Objective: To develop students' entrepreneurial, civic engagement, and problem-solving skills through a community-based project.

Kit Components:

- **Core Materials:**
  - **Project Planning Tools:** Project planning templates, Gantt charts, budget worksheets, presentation materials.
  - **Communication Tools:** Mobile phones with internet access (for research and communication), cameras, video recorders.
  - **Community Engagement Resources:** Local community maps, contact information for community leaders, guidelines for community engagement.
- **ICL Components:**
  - **Role Cards:**
    - **Project Manager:** Oversees the project timeline, delegates tasks, and ensures the project stays on track.
    - **Community Liaison:** Communicates with community members, gathers feedback, and builds relationships with community partners.
    - **Researcher:** Researches community needs, identifies potential project ideas, and gathers relevant information.
    - **Implementer:** Focuses on the practical implementation of the project, ensuring all tasks are completed efficiently and effectively.
    - **Evaluator:** Monitors project progress, collects data, and evaluates the project's impact on the community.
  - **Collaboration Tools:**
    - Online project management tools (e.g., Google Docs, Trello)
    - Social media platforms for communication and outreach
    - Presentation software (e.g., PowerPoint, Google Slides)
  - **Peer Assessment Rubrics:** Rubrics to assess individual and group contributions, teamwork, communication, problem-solving skills, and the overall impact of the project on the community.

Activities:

1. **Community Needs Assessment:** Groups conduct a needs assessment within their local community, identifying potential areas for improvement or projects that would benefit the community.
2. **Project Planning and Design:** Groups develop a detailed project plan, including project goals, objectives, timelines, budgets, and a communication strategy.
3. **Project Implementation:** Groups implement their chosen project, working collaboratively to overcome challenges and ensure the successful completion of the project.
4. **Project Evaluation and Reflection:** Groups evaluate the effectiveness of their project, analyze the impact on the community, and reflect on the challenges and successes of the project.
5. **Community Presentation:** Groups present their project to the community, sharing their experiences and the impact of their work.

Assessment:

- **Individual Assessments:** Assess individual student contributions based on their role responsibilities, participation in group discussions, and their individual contributions to the project.
- **Group Assessments:** Assess group projects based on the quality of the project plan, the effectiveness of project implementation, the impact on the community, and the presentation of findings.
- **Self-Assessment:** Encourage students to reflect on their own learning, their contributions to the group, and the challenges they faced during the project

Discussion

1. Current State of TLE Competencies among Grade 9 Learners. The following are the findings from the data gathered.

1.1 Technical Skills. The current state of TLE competencies among Grade 9 learners in terms of technical skills is to a moderate extent. This is evident with the composite mean of 2.80 that the indicators obtained. The Grade 9 learners properly care for and maintain tools and equipment according to their intended purpose and instructions implies that there is an emphasis on responsibility and accountability.

1.2 Problem Solving Skills. The data presented shows a moderate extent of the current state of TLE competencies among Grade 9 learners in terms of problem solving skills. This is reflected by the composite mean of 3.18 that the indicators obtained. This implies that while students possess some problem-solving abilities, there is room for significant improvement. This suggests a need for greater emphasis on developing critical thinking and problem-solving such as identifying and defining problems accurately, generating and evaluating potential solutions, implementing and refining solutions, and troubleshooting and adapting to unexpected challenges.

1.3 Creativity. There is a moderate extent of creativity among the Grade 9 learners. This is reflected by the composite mean of 3.14 that the indicators obtained. This implies that while students demonstrate some level of creativity, there is room for significant improvement in fostering and nurturing creative thinking within the TLE curriculum. The highest among the indicators are on is willing to try new things and explore different possibilities (3.78; high extent) and creates novel ways of completing TLE tasks (3.56; high extent).

2. Skill Performance of the Grade 12 Learners in TLE. There is a very satisfactory skill performance of the Grade 9 learners in TLE. This is reflected by the mean of 85.40 that the performance grades of the Grade 9 learners obtained in their TLE subject. A large percentage of the Grade 9 learners (145; 41.42%) obtained a very satisfactory skill performance. This is followed by satisfactory (101; 28.85%) skill performance. Outstanding skill performance is the second to the last with 86 or 24.57 percent of the Grade 9 learners. The least skill performance is on fairly satisfactory with 18 or 5.16 percent.

3. **Significant Relationship Between the Current State of TLE Competencies among Grade 9 Learners and their Skill Performance in the said subject.** The data presents that the technical skills and skill performance have a strong positive relationship (r=.725; p=0.01), as well as the problem solving and skill performance (r=.652; p=0.01). The strong positive correlation implies that there is a strong technical skills not just a byproduct of successful TLE education but rather a cornerstone of skill achievement within the subject.

4. **Proposed Learning Activity Kit.** There are five (5) learning activity kits prepared by the researcher which aims to enhance student learning by incorporating ICL strategies, fostering teamwork, communication, and problem-solving while developing essential

technical, problem solving, and creativity skills in the TLE classroom.

Recommendations

The following are the recommendations borne out of the findings of the study.

1. School administrators may prioritize the development of core technical skills through hands-on training, emphasizing precision, and ensuring safe and effective use of tools and equipment.

2. Teachers may integrate Independent Cooperative Learning (ICL) in their lessons in TLE as often as possible in order to further improve the academic performance of the learners in the subject.

3. Teachers may foster creativity by implementing open-ended projects, encouraging experimentation, and creating a learning environment that values originality and innovation.

4. Future researchers may validate the proposed learning activity kit crafted by the proponent in order to require students to identify, define, and solve complex problems, developing critical thinking and problem-solving skills.

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