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INSTRUCTIONAL STRATEGIES OF GRADE 8 TEACHERS TO FOSTER 4ES IN TEACHING TECHNOLOGY AND LIVELIHOOD EDUCATION

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Abstract : Recognizing the importance of innovative teaching methods in preparing students for real-world challenges, the study aims to understand how these strategies align with the principles of the 4Es framework and identify challenges encountered by teachers. The study employed a descriptive-correlational research design, gathering data from 123 Grade 8 teachers through structured questionnaires. Respondents' profiles, instructional strategies, and challenges were analyzed using statistical tools such as weighted means, correlations, and chi-square tests. The findings reveal that teachers frequently employ strategies that promote engagement, exploration, and empathy. However, addressing varying levels of student knowledge, ensuring equitable access to resources, and balancing interactive activities with curriculum requirements were identified as significant challenges. Notably, relationships were found between teachers' profiles—such as marital status, position, and sex—and their instructional approaches, highlighting the influence of personal and professional factors on teaching practices. Based on the findings, the study recommends enhancing professional development programs to improve differentiated instruction, increasing resource allocation for hands-on and technology-based activities, and fostering collaboration among teachers to share effective practices. These recommendations aim to support educators in addressing challenges and further enriching the teaching-learning process through the 4Es framework.

IndexTerms - Instructional strategies, Grade 8 teachers, foster, engage, explore, experience, empathize, challenges

I. INTRODUCTION

1.1 Rationale

Instructional strategies, sometimes referred to as teaching strategies, are techniques used by instructors to present material in a way that keeps students interested and exercising various skill sets. Different teaching tactics can be used by a teacher based on the unit topic, grade level, class size, and available resources in the classroom. A wide range of instructional methods are used to accommodate various student types and accomplish teaching and learning objectives (Teaching Methods, 2024).

Teachers also need to be willing to learn new things. To prepare for the new normal of education, we will need to unlearn to learn, which entails discarding outdated teaching strategies in favor of fresh ones. For this reason, we take the initiative to participate in the Department of Education's (DepEd) online training courses and upskilling initiatives. We can acquire methods, tactics, approaches, and methodologies for online and modular teaching through the DepEd's webinars. In addition, they improve our technological proficiency, promote physical health, and offer emotional and mental health support (Razalan, 2020).

The popularity of the 4Es framework has increased in recent years because of the MATATAG Curriculum, which prioritizes experiential and holistic learning methodologies. With this framework based on investigation and actual experiences, students become active participants in their learning experience through which deeper participation is aspired to be achieved. In other words, for example, engaging students in specifically worthy types of involvement enhances motivation and retention (ILoveDepEd, 2023).

This study aimed to determine the perceived level of instructional strategies used by the Grade 8 teachers of District Nueva Ecija Division in fostering 4Es in teaching Technology and livelihood Education. To determine the perceived level of the instructional strategies and the challenges being encountered by the teachers.

Furthermore, the findings may also be used as input for teacher training programs and curriculum guidelines, as well as strategies on how to distribute resources in promoting the effective use of the 4Es in teaching in TLE. Moreover, the result of the study may contribute to finding effective instructional strategies that can help teachers in TLE and other disciplines, as it may

enhance active learning and critical thinking. Additionally, the research can form part of the increasing literature pertaining to the 4Es framework along with its application in education.

1.2 Theoretical framework

Instructional strategies employed by teachers play a pivotal role in fostering the 4Es—Engagement, Exploration, Explanation, and Elaboration—in teaching Technology and Livelihood Education (TLE). These strategies are deeply rooted in various educational theories that provide a solid foundation for understanding and improving pedagogical practices. Below are three significant theoretical frameworks that underpin the instructional approaches of Grade 8 teachers.

Constructivist Learning Theory. Constructivism, as proposed by Piaget (1952) and later expanded by Vygotsky (1978), emphasizes that learners construct their knowledge through active engagement with the learning material and collaboration with peers. In the context of TLE, this theory highlights the importance of hands-on activities, problem-solving tasks, and project-based learning to engage students effectively. Teachers who implement constructivist strategies often encourage exploration and collaboration, which align with the 4Es framework. For instance, when teaching practical skills like cooking or carpentry, teachers can facilitate exploratory activities where students experiment with techniques and materials. Through guided discussions (explanation) and reflection, students can deepen their understanding and elaborate on their learning. According to recent studies, constructivist approaches have been shown to significantly enhance student engagement and retention, particularly in skill-based subjects like TLE (Sharma, 2018).

Experiential Learning Theory. Kolb's Experiential Learning Theory (1984) provides another vital framework for fostering the 4Es in TLE. This theory underscores the role of experience as a central component of the learning process, involving four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Teachers can design lessons that start with real-world experiences, such as field visits to local businesses or hands-on workshops, to stimulate engagement and exploration. The experiential approach not only supports student engagement but also enhances explanation and elaboration as students reflect on their experiences and apply the acquired knowledge in practical scenarios. For example, a lesson on entrepreneurship in TLE might include creating a small business plan, allowing students to conceptualize ideas and experiment with implementation strategies. Kolb's theory is particularly relevant for TLE as it bridges theoretical concepts with real-world applications, fostering both cognitive and practical skill development (McLeod, 2017).

Social Learning Theory. Bandura's Social Learning Theory (1977) posits that learning occurs through observation, imitation, and modeling, emphasizing the significance of social interactions in the educational process. In a TLE classroom, teachers can leverage this theory by incorporating collaborative activities and peer-led demonstrations to foster engagement and explanation. For example, students may observe their peers performing specific tasks, such as sewing or repairing gadgets, and replicate these actions under teacher guidance. The emphasis on modeling and feedback aligns with the 4Es, as students actively participate (engagement), observe and imitate (exploration), and reflect on their learning (explanation and elaboration). Recent research highlights the effectiveness of social learning strategies in enhancing collaborative skills and practical knowledge in vocational education settings (Park & Kim, 2019).

1.3 Conceptual Framework

The conceptual framework of this study provides a clear depiction of how various factors interplay to shape the instructional strategies of Grade 8 teachers in fostering the 4Es—Engage, Explore, Experience, and Empathize—in teaching Technology and Livelihood Education (TLE). It consists of three major components: the profile of respondents, the instructional strategies utilized, and the challenges encountered by teachers.

The independent variable focuses on the profile of respondents, encompassing key demographic and professional characteristics such as age, sex, civil status, length of service, and position. These factors significantly influence the way teachers design and implement their instructional strategies. For example, experienced teachers with longer service may employ more varied strategies, drawing from years of practice. At the same time, younger educators might adopt more technology-integrated approaches due to familiarity with digital tools. Additionally, gender and civil status may indirectly shape teachers' approaches to classroom management and student engagement.

The dependent variable is the instructional strategies used by Grade 8 teachers to foster the 4Es in TLE. These strategies are anchored on encouraging active participation (Engage), promoting hands-on and real-world applications (Explore and Experience), and nurturing empathy (Empathize) through collaborative activities. Effective strategies ensure that students do not merely acquire technical knowledge but also develop critical thinking and social skills, essential in a vocational subject like TLE. Teachers' ability to balance these four dimensions directly influences the quality of learning outcomes.

Finally, the framework considers the challenges encountered by teachers in employing these strategies. Challenges could range from limited resources, such as tools and materials for hands-on activities, to varying levels of student readiness or administrative constraints. These obstacles may hinder teachers from fully optimizing their instructional approaches, thereby affecting the implementation of the 4Es. Addressing these challenges is crucial for creating a supportive learning environment where both teachers and students can thrive.

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1.4 Statement of the Problem

This study aimed to determine the perceived level of instructional strategies used by the Grade 8 teachers of the Nueva Ecija Division in fostering 4Es in teaching Technology and livelihood Education. Specifically, it sought to answer the following questions:

1. What is the profile of the respondents in terms of:
   - 1.1 Age;
   - 1.2 Sex;
   - 1.3 Marital Status;
   - 1.4 Length of Service;
   - 1.5 Position; and

1.6 Number of Relevant trainings and seminars?

2. What is the perceived level of instructional strategies used by the respondents in fostering 4Es in teaching Technology and livelihood Education in terms of:
   2.1 Engage;
   2.2 Explore;
   2.3 Experience; and
   2.4 Empathize?
3. Is there a significant relationship between the perceived level of instructional strategies used and the profile of the respondents?
4. What are the challenges encountered while using the instructional strategies in fostering 4Es?
5. What program of activity can be proposed based on the findings of the study?

1.5 Null Hyphothesis

In line with the sub-problems, this study tested the hypothesis in its null form at alpha level 0.05.

1. There is no significant relationship between the perceived level of instructional strategies used and the profile of the respondents and the profile variables of respondents

1.6 Scope and Delimitation of the Study

The scope of the study encompasses the teachers' strategies, their alignment with the 4Es framework, and the factors that influence their implementation in the classroom. By doing so, the study aims to shed light on the instructional practices that contribute to effective TLE teaching and the challenges that hinder their execution.

The study is delimited to Grade 8 teachers within the Nueva Ecija Division, which means that findings and conclusions drawn from this research may not necessarily reflect the practices and challenges of teachers outside this geographic and administrative area.

The participants are further delineated by their demographic and professional characteristics, including age, sex, marital status, length of service, position, and the number of relevant trainings and seminars they have attended. These variables provide a profile of the respondents, which is examined for its relationship with their instructional strategies.

In terms of instructional strategies, the study is structured around the 4Es framework, which includes engagement (capturing students' interest), exploration (allowing students to investigate and experiment), experience (applying knowledge through hands-on activities), and empathy (fostering collaborative and inclusive learning environments). These components serve as benchmarks for evaluating the respondents' teaching methods and how effectively they align with the principles of fostering active learning in TLE.

The study also investigates the challenges that Grade 8 teachers encounter when implementing instructional strategies aligned with the 4Es. These challenges could stem from various factors such as limited resources, diverse student needs, time constraints, or institutional support, providing a comprehensive view of the barriers teachers face in achieving their instructional goals.

It is important to note that the study is limited to the perceptions of the respondents, which means that the data primarily rely on self-assessments and subjective feedback rather than objective observations of teaching practices. Furthermore, the scope does not include the perspectives of students or administrators, which could provide additional insights into the effectiveness and implementation of the instructional strategies.

1.7 Significance of the Study

The following shows how the results of the study are beneficial to the participants and the stakeholders.

School Administrators. The result of the study provides school administrators with valuable insights into the instructional strategies employed by Grade 8 teachers in fostering the 4Es—Engage, Explore, Experience, and Empathize—in teaching Technology and Livelihood Education (TLE). These findings can serve as a basis for developing targeted professional development programs, allocating resources effectively, and implementing policies that support innovative and student-centered teaching practices. Additionally, understanding the challenges faced by teachers enables administrators to address systemic issues and create an environment conducive to effective teaching and learning.

Teachers. The result of the study highlights the effectiveness of various instructional strategies and their alignment with the 4Es framework. Teachers can use these findings to reflect on their current practices, identify areas for improvement, and adopt strategies that promote active learning and skill development in TLE. Furthermore, the study provides practical recommendations to overcome challenges in implementing these strategies, empowering educators to deliver more engaging and meaningful lessons.

Learners. The result of the study underscores the importance of instructional strategies in enhancing learners' engagement, exploration, experiential learning, and empathy within the TLE classroom. With improved teaching approaches, students stand to benefit from a more dynamic and interactive learning experience that fosters both technical skills and personal growth. The emphasis on the 4Es ensures that learners are not only prepared for vocational pursuits but also equipped with critical thinking, collaboration, and problem-solving skills essential for future success.

Researchers. The result of the study offers a foundation for further investigation into instructional strategies and their impact on student outcomes in TLE. It opens avenues for exploring innovative teaching methods, assessing their effectiveness in different contexts, and examining how various factors influence the implementation of the 4Es. The study's findings can also serve as a reference for comparative analyses or interdisciplinary research in education.

Stakeholders. The result of the study is significant to stakeholders, including policymakers and community leaders, as it emphasizes the importance of supporting teachers in fostering the 4Es. Stakeholders can use the findings to advocate for increased funding, training opportunities, and partnerships that enhance the delivery of TLE. Moreover, the study highlights the need for a collaborative effort to address the challenges faced by educators, ensuring that TLE programs remain relevant and impactful.

Parents. The result of the study provides parents with an understanding of how effective instructional strategies contribute to their children's holistic development in TLE. By becoming more aware of the 4Es framework, parents can better support their children's

learning experiences at home and appreciate the value of TLE in preparing their children for future endeavors. The study also highlights the importance of parental involvement in addressing challenges that may affect the learning environment.

Future Researchers. The result of the study serves as a valuable resource and reference point for exploring related topics. It provides a detailed analysis of instructional strategies, their impact on fostering the 4Es, and the challenges associated with their implementation. Future researchers can build on this work by expanding its scope, exploring its implications in other subjects or grade levels, or employing alternative methodologies to validate and extend the findings.

1.8 Definition of Terms

Instructional Strategies. It refers to the techniques, methods, and approaches employed by teachers to facilitate learning and ensure that students achieve specific learning objectives (Reigeluth, 2019). In this study, it refers to the specific methods used by Grade 8 teachers to foster the 4Es—Engage, Explore, Experience, and Empathize—in teaching Technology and Livelihood Education.

Grade 8 Teachers. It refers to educators responsible for teaching students in the eighth grade, typically those in the middle school level, who design and deliver subject-specific instruction aligned with curriculum standards (OECD, 2020). In this study, it refers to the teachers handling Grade 8 Technology and Livelihood Education in the Nueva Ecija Division.

Foster. It refers to the act of encouraging, nurturing, or promoting the development of something, such as skills, attitudes, or understanding (Cambridge Dictionary, 2022). In this study, it refers to the act of encouraging the development of the 4Es—Engage, Explore, Experience, and Empathize—in Grade 8 students during TLE instruction.

Engage. It refers to the process of capturing and maintaining the interest and attention of learners during a particular activity or lesson (Anderson et al., 2019). In this study, it refers to the strategies used by teachers to stimulate the interest of Grade 8 students in learning TLE concepts and activities.

Explore. It refers to the act of investigating, experimenting, or examining something to discover new information or deepen understanding (Merriam-Webster, 2021). In this study, it refers to how teachers encourage students to investigate, experiment, and interact with TLE materials or concepts to broaden their knowledge and skills.

Experience. It refers to the process of gaining knowledge or skills through direct involvement or participation in activities (Kolb, 2020). In this study, it refers to the hands-on activities facilitated by teachers that allow Grade 8 students to apply their learning in practical and real-world contexts.

Empathize. It refers to the ability to understand and share the feelings, perspectives, or experiences of others (Goleman, 2021). In this study, it refers to how teachers foster collaborative and inclusive learning environments, allowing Grade 8 students to develop interpersonal skills and understanding of others' viewpoints during TLE activities.

Challenges. It refers to difficulties or obstacles that hinder the completion of tasks or the achievement of goals (Oxford Learner's Dictionary, 2019).

Operational Definition: In this study, it refers to the difficulties faced by Grade 8 teachers in implementing instructional strategies to foster the 4Es in TLE, such as resource limitations, varying student readiness, or institutional constraints.

II. RESEARCH METHODOLOGY

This chapter discusses research methodology, which includes research design and the procedures used to solve research problems. Similarly, it discusses the data collection tools as well as the statistical treatments that will be used to analyze the data.

2.1 Research Design

The research design employed in this study is descriptive correlation, a methodology that examines the relationship between variables without manipulating them. Descriptive correlation is an appropriate approach for this thesis as it seeks to determine the relationship between the profile of Grade 8 teachers and the perceived level of instructional strategies, they use in fostering the 4Es—Engage, Explore, Experience, and Empathize—in teaching Technology and Livelihood Education (TLE). This design aligns well with the study's objectives of describing the current practices of teachers and exploring whether specific demographic and professional factors influence these practices.

Descriptive research is integral to understanding and summarizing existing conditions or phenomena as they naturally occur. In this study, it provides a comprehensive picture of the instructional strategies utilized by Grade 8 TLE teachers, their alignment with the 4Es framework, and the challenges encountered in their implementation. The correlation aspect of the design, on the other hand, allows for the examination of statistical relationships between teachers' demographic profiles (e.g., age, sex, marital status, length of service, position) and their instructional practices. This relationship is vital to uncovering patterns that may influence or hinder the effective fostering of the 4Es in the classroom (Creswell & Creswell, 2018).

Using a descriptive-correlational design is particularly appropriate for this thesis because it does not aim to manipulate variables but rather to observe and analyze them in their natural context. This is crucial for educational research, where individual experiences, institutional policies, and systemic constraints shape variables such as teacher profiles and instructional strategies. Furthermore, the correlational aspect provides valuable insights into whether teacher characteristics have a significant impact on their ability to implement specific strategies, as supported by recent studies emphasizing the importance of understanding educator profiles in shaping effective pedagogy (Fraenkel, Wallen, & Hyun, 2019).

Additionally, the descriptive-correlational design allows for the inclusion of diverse data sources, such as survey questionnaires or self-assessments, to gather perceptions about instructional strategies and the challenges faced by teachers. This holistic approach ensures that the data collected is robust and reflective of the real-world classroom environment, making the findings highly relevant and applicable to educational stakeholders.

2.2 Sources Data

This study was conducted within the Nueva Ecija City Division, comprising 155 secondary schools. Nueva Ecija is a province located in Central Luzon, Philippines, known for its agricultural prominence and its dedication to providing quality education to its residents. The area is home to a diverse population of learners, many of whom rely on the Technology and

Livelihood Education (TLE) curriculum to develop practical skills and competencies that are essential for future employment or entrepreneurial endeavors.

The participating secondary schools are situated and serve as a representative area within the Nueva Ecija City Division for examining the instructional practices of Grade 8 teachers. These schools are characterized by their commitment to delivering the TLE program, which includes various strands such as home economics, industrial arts, agriculture, and information and communication technology. Given the district's unique context, the study explores how teachers adapt their instructional strategies to address the needs of learners in fostering the 4Es—Engage, Explore, Experience, and Empathize.

Furthermore, the study's locality presents both opportunities and challenges for educators. Schools in the district vary in terms of access to resources, facilities, and training opportunities, which may influence the implementation of instructional strategies. By focusing on this specific area, the study seeks to capture the lived realities of teachers and students in a setting that reflects both the strengths and limitations of educational delivery in a provincial context.

The choice of the Nueva Ecija City Division underscores the importance of exploring educational practices in local settings. This study aims to contribute to the understanding of how regional factors, such as the availability of professional development programs, community involvement, and resource allocation, shape the teaching and learning process. Ultimately, the findings from this locality are intended to inform and inspire improvements not only within the district but also in similar educational contexts throughout the province and beyond.

2.3 Population Sampling

This study employs convenience sampling as its primary technique for selecting participants. Convenience sampling is a non-probability sampling method that involves selecting respondents who are readily accessible and willing to participate in the research. In the context of this thesis, the study focuses on Grade 8 Technology and Livelihood Education (TLE) teachers in the Nueva Ecija City Division. These teachers were chosen based on their availability and proximity to the researcher, which made data collection more practical and efficient.

Convenience sampling is appropriate for this study because it allows the researcher to gather data from a specific group of respondents directly involved in the implementation of the 4Es—Engage, Explore, Experience, and Empathize—in TLE instruction. Since the study is bounded by time and logistical constraints, this method provides a feasible approach to obtaining the necessary data without compromising the study's objectives. According to Etikan and Bala (2017), convenience sampling is particularly useful in exploratory and descriptive research, as it enables researchers to gather data from individuals who meet the inclusion criteria quickly.

Moreover, the use of convenience sampling aligns with the study's quantitative nature. The research seeks to describe and analyze the relationship between teachers' profiles and their instructional strategies, as well as the challenges they encounter. By utilizing a sample that is easily accessible, the researcher can efficiently collect a sufficient amount of data to perform statistical analyses, ensuring that the findings are both reliable and relevant to the study's objectives. Despite its non-random nature, convenience sampling can still yield valuable insights, especially when the population of interest shares similar characteristics or experiences (Taherdoost, 2019).

Another reason for the appropriateness of convenience sampling in this study is the limited availability of Grade 8 TLE teachers who meet the criteria and are willing to participate. This method allows the researcher to capitalize on the accessibility of respondents while focusing on a population that is directly relevant to the study. The practical advantages of convenience sampling, such as reduced time, cost, and effort, make it an ideal choice for educational research conducted in specific localities, such as the Nueva Ecija City Division.

While convenience sampling has its limitations, including potential biases due to the non-random selection of participants, these drawbacks are mitigated in this study by ensuring that the respondents represent a meaningful segment of the target population. Additionally, the researcher takes steps to enhance the reliability of the findings by including as many eligible participants as possible and analyzing data critically to draw well-supported conclusions.

2.4 Instrumentation and Data Collection

The data collection process for this study utilized a self-made questionnaire specifically designed to align with the principles and objectives outlined in the MATATAG Agenda of the Department of Education's Shaping Paper. The MATATAG framework emphasizes the importance of quality education through effective teaching practices, making it a relevant guide in crafting the questionnaire to measure the instructional strategies of Grade 8 teachers in fostering the 4Es—Engage, Explore, Experience, and Empathize—in Technology and Livelihood Education (TLE). The questionnaire was meticulously developed to ensure it covered key aspects of the research objectives and captured comprehensive data on teachers' profiles, their perceived instructional strategies, and the challenges they encountered.

To ensure the validity and reliability of the instrument, the self-made questionnaire was subjected to expert validation. Three professionals with expertise in education, curriculum design, and research methodology assessed the questionnaire using a 10-item validation tool.

Numerical value	Score Range	Description
5	4.51 – 5.00	Very High (VH)
4	3.51 – 4.50	High (H)
3	2.51 – 3.50	Moderate (M)
2	1.51 – 2.50	Low (L)
1	1.00 – 1.50	Very low (VL)

This tool evaluated the instrument based on criteria such as clarity of items, alignment with research objectives, appropriateness of content, and overall structure. The feedback provided by the validators was used to refine the questionnaire, ensuring that it accurately addressed the study's research questions and adhered to scholarly standards. According to Creswell and

Creswell (2018), expert validation is essential in enhancing the credibility and robustness of research instruments, particularly in educational studies.

The finalized questionnaire was designed to be both comprehensive and user-friendly, consisting of sections that gathered data on teachers' demographic profiles, their use of 4E-aligned instructional strategies, and the challenges they faced in implementing these strategies. Each item was formulated to elicit precise and meaningful responses, allowing for a thorough analysis of the data. The questionnaire employed a Likert scale for most items, enabling respondents to express the degree to which they agreed or disagreed with statements regarding their instructional practices and challenges.

For convenience and accessibility, the questionnaire was administered through Google Forms. This digital platform allowed the researcher to efficiently distribute the questionnaire to respondents within the Nueva Ecija City Division. Google Forms also facilitated real-time data collection and organization, minimizing logistical challenges associated with traditional paper-based surveys. The use of an online platform was particularly advantageous given the increasing reliance on digital tools in education and research, as well as the need to accommodate teachers' busy schedules. Studies have shown that online data collection methods can yield reliable results while reducing costs and time (Taherdoost, 2019).

2.5 Tools for Data Analysis

To derive valuable insights and make significant discoveries, the data underwent a rigorous analysis employing appropriate statistical methods through IBM SPSS Statistics 20. This process ensured the precision of the results in accurately portraying the real situation and providing solutions to the research's addressed concerns.

To answer sub-problem 1, the profile of the respondents, frequency counts, and percentages were used.

To answer sub-problems 2, the perceived level of instructional strategies used by the respondents in fostering 4Es in teaching Technology and livelihood, the weighted mean was computed and described using a five-point Likert scale with a descriptive equivalent shown below:

Score	Median Score Range	Descriptive Equivalents
5	4.51 – 5.00	Always (A)
4	3.51 – 4.49	Often (O)
3	2.51 – 3.49	Sometimes (S)
2	1.51 – 2.49	Rarely (R)
1	1.00 – 1.49	Never (N)

To answer sub-problem 3 and to test if there is a significant relationship between the perceived level of instructional strategies in fostering 4Es in teaching Technology and livelihood and the respondents' profile variables, Pearson-R, Point Biserial, and Spearman-rho were utilized.

To answer sub-problem number 4, Challenges Encountered by Teachers in Using Instructional Strategies to Foster 4Es in Teaching Technology and Livelihood Education, the weighted mean was computed; Mean and Rank are described using a five-point Likert scale with a descriptive equivalent shown below:

Score	Median Score Range	Descriptive Equivalents
5	4.51 – 5.00	Very Highly Serious (ES)
4	3.51 – 4.50	Very Serious (VS)
3	2.51 – 3.50	Serious (SoS)
2	1.51 – 2.50	Slightly Serious (SlS)
1	1.00 – 1.50	Not Serious (NS)

To answer sub-problem number 5, recommendations and a plan of action were proposed.

III. RESULTS AND DISCUSSION

This chapter presents the results of the study based on the gathered, analyzed, and interpreted data. The results are arranged according to the order of the problems stated in the previous chapter.

3.1 Relationship between the Instructional Strategies Used by Grade 8 Teachers to Foster 4Es between the Profile Variable of Respondents

Table 1. Test of Relationship between the Instructional Strategies Used by Grade 8 Teachers to Foster 4Es between the Profile Variable of Respondents

Profile		Engage	Explore	Experience	Empathize	Instructional Strategies
Age[b]	r Sig.	-0.092 0.312	0.020 0.825	**-0.183*** **0.043**	-0.047 0.606	-0.069 0.446
Sex[a]	r Sig.	**-0.232**** **0.010**	-0.120 0.188	**-0.219*** **0.015**	**-0.205*** **0.023**	**-0.217*** **0.016**
Position[b]	r Sig.	**-0.411**** **0.000**	**-0.238**** **0.008**	**-0.387**** **0.000**	**-0.481**** **0.000**	**-0.367**** **0.000**

Marital Status[c]	r Sig.	**0.501** **0.001**	**0.489** **0.001**	**0.822** **0.000**	**0.796** **0.000**	**0.911** **0.000**
Length of Service[a]	r Sig.	-0.080 0.379	0.025 0.785	-0.007 0.940	**-0.213*** **0.018**	-0.022 0.812

*Significant at 0.05

**Significant at 0.001 (two-tail)

[a]Point Biserial Correlation; [b]Spearman – Rho, [c]Chi-square

Table 1 presents the results of the test of relationships between the instructional strategies used by Grade 8 teachers to foster the 4Es framework (Engage, Explore, Experience, Empathize) and the profile variables of the respondents. The table reveals various statistical correlations between the profile variables and the instructional strategies employed by the teachers. Notably, the variable "Sex" demonstrates significant negative correlations with all four components of the 4Es framework, with the strongest relationships occurring in "Engage" (r = -0.232, p = 0.010), "Empathize" (r = -0.219, p = 0.015), and "Experience" (r = -0.205, p = 0.023), suggesting that male teachers may employ instructional strategies differently than their female counterparts.

In contrast, "Position" shows strong, negative correlations across all 4Es, particularly with "Engage" (r = -0.411, p = 0.000), "Explore" (r = -0.238, p = 0.008), and "Experience" (r = -0.387, p = 0.000), indicating that teachers in higher positions may employ a less hands-on or exploratory approach to teaching. This finding supports literature that stresses the importance of teacher experience and role in shaping teaching strategies. For instance, Villegas (2022) observed that higher-level teachers tend to possess more refined classroom management skills but may sometimes struggle with the practical application of newer teaching methods, especially in a hands-on field like TLE.

Moreover, marital status correlates positively with all four aspects of the 4Es, with especially strong relationships in "Experience" (r = 0.822, p = 0.000) and "Empathize" (r = 0.796, p = 0.000). These findings align with studies such as Nama and Queroda (2020), which suggest that more experienced teachers (often correlated with being married) exhibit greater proficiency in various teaching strategies, including those that foster empathy and real-world application. This may be linked to the social and emotional maturity that often accompanies marital status, enhancing a teacher's ability to connect with students.

The variable "Length of Service" shows mixed results. It is negatively correlated with "Empathize" (r = -0.213, p = 0.018), while showing no significant relationship with the other aspects of the 4Es. This may indicate that while long-term experience helps with technical skills and classroom management, it might not necessarily translate into a greater capacity for fostering empathy or engagement in certain contexts. This finding resonates with research by Collano (2024), who suggests that a teacher's length of service does not always correlate directly with the effectiveness of their instructional strategies, particularly in non-technical aspects like empathy and emotional support.

Overall, the data presented in Table 10 highlights the complex relationships between teachers' profiles and the instructional strategies they employ. The findings suggest that factors such as position, marital status, and gender significantly influence how teachers apply the 4Es in their teaching of Technology and Livelihood Education. The literature reviewed also reinforces the notion that teaching strategies are shaped by a range of personal and professional factors, emphasizing the need for tailored professional development programs that address these variables.

3.2 Challenges Encountered by Teachers in Using Instructional Strategies to Foster 4Es in Teaching Technology and Livelihood

Table 2. Challenges Encountered by Teachers in Using Instructional Strategies to Foster 4Es in Teaching Technology and Livelihood Education

INDICATORS	Weighted Mean	Rank
Address varying levels of prior knowledge and skills.	**4.26**	**1**
Promote empathy in a competitive academic setting.	**4.22**	**2**
Encourage critical thinking while managing classroom dynamics.	**4.18**	**3**
Provide adequate resources for hands-on activities.	**4.12**	**4**
Guide students in independent research without direct supervision.	**4.06**	**5**
Ensure equitable access to materials and technology for all students.	4.03	6
Incorporate technology effectively without technical issues.	4.02	7
Maintain student interest throughout lengthy lessons.	3.98	8
Capture students' attention amidst numerous distractions.	3.94	9
Balance interactive activities with curriculum requirements.	3.92	10

Table 2 presents the challenges encountered by Grade 8 teachers in using instructional strategies to foster the 4Es (Engage, Explore, Experience, Empathize) in teaching Technology and Livelihood Education (TLE). The data reveals the weighted mean scores and ranks for various obstacles faced by teachers, with the most pressing challenge being the need to address varying levels of prior knowledge and skills among students, which received a weighted mean of 4.26, ranking first. This suggests that teachers face significant difficulty in adapting their instruction to meet the diverse academic backgrounds and competencies of their students.

This challenge is consistent with the findings of previous studies, which emphasize that teachers must possess a broad range of subject-matter expertise to effectively teach TLE, as it integrates both theoretical knowledge and practical skills (Elli & Ricafort, 2020).

Another significant challenge, ranked second with a weighted mean of 4.22, is promoting empathy in a competitive academic setting. Empathy is increasingly recognized as a critical component of effective teaching, especially in fostering collaborative learning environments. Studies highlight that the development of empathy not only enhances student-teacher

relationships but also aids in creating a more inclusive and supportive classroom environment, as it helps students understand and connect with others (ILoveDepEd, 2023). This challenge reflects the global imperative to develop 21st-century skills, which emphasize interpersonal abilities and emotional intelligence (Aldrup et al., 2022).

The third challenge listed in Table 11, with a weighted mean of 4.18, is encouraging critical thinking while managing classroom dynamics. Teachers must balance fostering independent thought with maintaining order and ensuring that all students are actively engaged in the learning process. This difficulty aligns with the findings from various studies, which note that teachers often struggle with finding ways to nurture critical thinking while ensuring that classroom management does not hinder student participation and engagement (Teaching Strategies, 2024).

In terms of resource-related challenges, the table indicates that providing adequate resources for hands-on activities is another obstacle, ranking fourth with a weighted mean of 4.12. This challenge points to the practical constraints in TLE classrooms, where resources and equipment are often insufficient to support the interactive and experiential learning methods required by the 4Es framework (Basal, 2022). This is echoed in several studies, which underscore the importance of having sufficient materials to facilitate hands-on learning experiences in TLE, particularly given the subject's focus on real-world applications (Villegas, 2022).

Further challenges include guiding students in independent research without direct supervision (ranked fifth, weighted mean of 4.06) and ensuring equitable access to materials and technology for all students (ranked sixth, weighted mean of 4.03). These issues highlight the struggle to foster student autonomy while ensuring that all learners, regardless of their socioeconomic background, have the resources they need to succeed in technology-oriented education. The lack of adequate training and resources, especially in low-income settings, has been identified as a barrier to effectively implementing these strategies (Razalan, 2020; Kong, 2021).

Incorporating technology without technical issues (ranked seventh, weighted mean of 4.02) and maintaining student interest throughout lengthy lessons (ranked eighth, weighted mean of 3.98) are also significant concerns. These challenges are especially relevant in the context of the rapid shift to digital learning environments, where technical difficulties can disrupt the flow of lessons and hinder the use of modern instructional strategies (Abayon, 2024). Moreover, engaging students in lengthy lessons and capturing their attention amidst distractions remains a challenge that many teachers face, particularly when integrating technology into the curriculum (ILoveDepEd, 2023).

The final two challenges in Table 11—capturing students' attention amidst numerous distractions (ranked ninth, weighted mean of 3.94) and balancing interactive activities with curriculum requirements (ranked tenth, weighted mean of 3.92)—highlight the difficulty of maintaining engagement in an environment where students are frequently distracted by digital devices or other external factors. Balancing the need for interactive, student-centered learning with the constraints of a prescribed curriculum is a common concern among teachers across various subjects (Teaching Methods, 2024).

These findings reflect the broader challenges faced by TLE teachers, who must navigate a complex landscape of varying student needs, resource limitations, and technological demands. The results underscore the importance of continued professional development, resource allocation, and curriculum adaptation to address these challenges effectively.

IV. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents the summary, conclusions, and recommendations based on the gathered, analyzed, and interpreted results.

4.1 Summary

The main objective of the study entitled "Instructional Strategies of Grade 8 Teachers to Foster 4Es in Teaching Technology and Livelihood Education (Nueva Ecija City Division)" is to assess the instructional strategies employed by Grade 8 teachers to promote the 4Es (Engage, Explore, Experience, Empathize) in teaching Technology and Livelihood Education (TLE) and to identify the challenges they face in implementing these strategies. The study aims to provide insights into the effectiveness of these strategies and the factors that hinder their successful application in the classroom.

Set at 0.05 alpha level, the null hypothesis of the study posits that there is no significant relationship between the instructional strategies used by Grade 8 teachers and the perceived challenges they encounter in fostering the 4Es framework in TLE. This hypothesis will be tested to determine whether any factors, such as teacher experience or other factors, influence the effectiveness of these strategies.

For the research design, the study adopts a descriptive-correlational approach. This design allows the researchers to describe the instructional strategies used by teachers and analyze the correlation between the strategies and the challenges faced by the teachers in fostering the 4Es. The descriptive aspect focuses on gathering data about teachers' perceptions and experiences, while the correlational aspect examines potential relationships between various variables.

The sampling technique used in the study is a convenience sampling method, focusing on Grade 8 teachers within the Nueva Ecija City Division who are involved in teaching TLE. This approach ensures that the sample consists of teachers who have relevant experience and knowledge regarding the instructional strategies employed in TLE classes.

The data collection was primarily conducted through a structured questionnaire, which was designed to gather information on the teachers' instructional strategies, the challenges they face, and their perceived effectiveness in fostering the 4Es. The questionnaire was developed with the help of existing literature and aligned with the objectives of the study to ensure its relevance and comprehensiveness.

For statistical treatment, the study utilized descriptive statistics such as weighted mean to summarize the teachers' responses and rank the challenges they encountered. Additionally, correlation analysis was applied to examine any significant relationships between the teachers' instructional strategies and the profile variables of the respondents. This statistical approach helped in interpreting the data and testing the null hypothesis.

4.2 Conclusions

From the presented results, the following conclusions are drawn:

1. The profile of the respondents reveals that the majority of Grade 8 teachers belong to the younger to middle age brackets, predominantly female, and are married. Most have moderate teaching experience and hold positions as Teacher III, indicating a diverse range of teaching expertise within the group.
2. Significant relationships exist between certain profile variables and the instructional strategies used to foster the 4Es. For instance, marital status is strongly correlated with the adoption of these strategies, while position and sex also demonstrate notable connections, suggesting that personal and professional backgrounds influence teaching approaches.
3. Teachers frequently use strategies that align with the 4Es framework, but their effectiveness is influenced by challenges such as addressing diverse student needs and maintaining empathy in competitive classroom environments.
4. The challenge of addressing varying levels of student knowledge and skills ranks as the most significant, indicating a need for more differentiated instruction and inclusive practices.
5. Limited access to resources for hands-on activities and technology-related difficulties highlight gaps in logistical and infrastructural support for teachers.
6. Teachers struggle to maintain a balance between interactive and curriculum-driven activities, reflecting the pressure to meet academic standards while fostering engaging and meaningful learning experiences.

4.3 Recommendations

Based on the results of the study, the following recommendations are hereby presented:

1. Professional development programs should be designed to enhance teachers' skills in differentiated instruction, enabling them to address diverse student abilities and learning needs effectively.
2. Schools should invest in improving resource availability, including materials for hands-on activities and reliable technology, to support innovative and effective teaching strategies.
3. Empathy-building workshops and training on creating inclusive classrooms should be conducted to help teachers foster empathy in competitive academic settings without compromising classroom harmony.
4. Collaboration among teachers should be encouraged to share best practices and strategies for balancing interactive activities with curriculum requirements, ensuring that both engagement and academic goals are met.
5. Policymakers and school administrators should consider providing additional support to teachers in lower-ranked positions, as they may face greater challenges in implementing instructional strategies effectively.
6. Regular evaluation of teaching practices and infrastructure should be conducted, involving feedback from teachers, to identify and address specific challenges related to resources, technology, and student engagement.

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