OPEN ACCESS Crossref doi creative commons

INSTABRIGHT

INTERNATIONAL JOURNAL OF EDUCATION AND SOCIAL SCIENCES

RESEARCH ARTICLE

TEACHING STRATEGIES AS PREDICTORS OF PRACTICAL SKILLS PERFORMANCE AND WORKFORCE READINESS AMONG SENIOR HIGH SCHOOL STUDENTS IN FAMILY AND CONSUMER SCIENCE EDUCATION

JONNAMEI A. ESCOBAR
University of Perpetual Help System – DALTA
Las Piñas City, Philippines
jonnameiescobar@gmail.com

Article History
Received: September 30, 2026
Revised: October 17, 2026
Published: October 30, 2026

ABSTRACT

This study examined teaching strategies as predictors of self-assessed practical skills performance and perceived workforce readiness among Grade 11 and Grade 12 Family and Consumer Science (FCS) students at Parañaque National High School-Baclaran during School Year 2025–2026. Using a quantitative, non-experimental predictive-correlational design, the study adopted a census approach involving 168 students. Data were collected through a researcher-developed questionnaire and analyzed using descriptive statistics, Pearson product-moment correlation, multiple regression analysis, and independent-samples t-tests. Teaching strategies, practical skills performance, and workforce readiness were rated to a very great extent. Correlation analysis revealed significant moderate relationships between all five teaching strategies and technical competence, procedural accuracy and quality of work, and productivity and efficiency ($r = .58–.74$, $p < .001$), but not safety practices and work discipline. Regression analysis showed that demonstration, collaborative learning, and experiential learning activities significantly predicted technical competence ($R^2 = .615$); demonstration, experiential learning, and differentiated instruction predicted procedural accuracy and quality of work ($R^2 = .578$); and experiential learning and technology-integrated instruction predicted

productivity and efficiency (R^2 = .586). The regression model for safety practices and work discipline was not significant. For workforce readiness, teaching strategies significantly predicted communication and problem-solving skills but not teamwork, adaptability, or work values and professionalism. No significant grade-level differences were found in assessments of teaching strategies or practical skills performance. The findings informed the development of a Teaching Strategies Enhancement Framework to strengthen FCS instruction and students' perceived competencies and workforce readiness.

Keywords: *Family and Consumer Science, practical skills performance, teaching strategies, workforce readiness*

INTRODUCTION

Family and Consumer Science (FCS) education develops practical competencies that learners can use in household management, food preparation, entrepreneurship, and service-related occupations. In Philippine Senior High School (SHS), these learning areas are commonly addressed through the Technical-Vocational-Livelihood (TVL) Track, particularly the Home Economics strand. The Department of Education's (DepEd) K to 12 Senior High School TVL Track Specialized Subject – Home Economics: Cookery NC II Curriculum Guide identifies competencies such as using kitchen tools and equipment, performing measurements, observing occupational health and safety procedures, and preparing food products (DepEd, 2022). These requirements demonstrate that FCS-related learning involves more than understanding concepts; students must also execute procedures accurately, maintain quality and safety, manage time, and demonstrate responsible work habits.

The practical nature of FCS makes it a distinct area for investigating how teaching strategies contribute to students' readiness for employment and entrepreneurship. Unlike subjects assessed mainly through written examinations, FCS requires learners to translate

knowledge into observable performance. For example, food preparation involves following standardized procedures, selecting appropriate tools, observing sanitation practices, coordinating tasks, and producing acceptable outputs within a given period. Similarly, entrepreneurship-related activities require planning, problem-solving, communication, and resource management. Consequently, effective FCS instruction must provide opportunities for demonstration, guided practice, collaboration, independent performance, and feedback.

Workforce readiness is also an important concern in Philippine education. The Department of Education's collaboration with the Japan International Cooperation Agency to evaluate the labor-market outcomes of SHS graduates reflects the continuing need to assess whether the program prepares learners for employment and other postsecondary pathways (DepEd, 2021). In a Philippine study, Roble (2023) examined the competencies of TVL students, employers' expectations, and work immersion performance, highlighting the relevance of comparing students' acquired competencies with workplace requirements. Although such findings provide useful context for vocational education, they do not automatically establish the readiness of FCS learners at every school or in every specialization.

International evidence reinforces this concern. The International Labour Organization (ILO), UNESCO, and World Bank (2023) emphasized that technical and vocational education and training systems need to respond more effectively to changing labor-market requirements and skills mismatches. Similarly, the Organisation for Economic Co-operation and Development (OECD, 2023) stressed the importance of developing vocational education and training systems that remain responsive to evolving workplace demands. For FCS, this responsiveness means preparing learners not only to complete classroom activities but also to demonstrate dependable practical performance, communication, teamwork, problem-solving, and workplace discipline.

Industry partners and community stakeholders likewise emphasize the importance of practical competence among senior high school graduates. Employers often expect learners to

possess not only technical knowledge but also workplace-related skills. However, some industry partners note that although graduates may have acquired basic theoretical understanding, there are instances in which they still require further training to meet workplace expectations. This observation points to a possible gap between classroom-based learning experiences and the actual demands of work environments.

At Parañaque National High School-Baclaran, examining these concerns within FCS is particularly relevant because the quality of practical learning depends on how students experience instruction and apply competencies during performance-based activities. Preliminary classroom observations may indicate differences in students' independence, accuracy, task completion, and adherence to safety procedures. Teachers may also encounter challenges involving instructional time, access to materials and equipment, class size, and opportunities for repeated practice.

Despite broader research on vocational education and employability, school-level evidence connecting specific teaching strategies with practical skills performance and workforce readiness in FCS remains necessary. In response to these concerns, the present study sought to examine the relationship between teaching strategies and practical skills performance among Grade 11 and Grade 12 students at Parañaue National High School-Baclaran. Specifically, the study aimed to identify the teaching strategies commonly employed in FCS classes, assess the level of students' practical skills performance across selected competencies, and determine whether a significant relationship exists between these variables. The findings of the study may provide valuable insights for teachers, school administrators, curriculum planners, and industry stakeholders in improving instructional practices and strengthening practical skills development among learners.

Theoretical Framework

This study was anchored on three theories: Kolb's (1984) Experiential Learning Theory, Bandura's (1977) Social Learning Theory, and Constructivist Learning Theory,

particularly the perspectives of Piaget (1970) and Vygotsky (1978). These theories provided the basis for explaining how the teaching strategies examined in the study may be associated with students' practical skills performance and workforce readiness in Family and Consumer Science (FCS) education. Each theory explains a different aspect of learning: learning through experience, learning through observation and social interaction, and learning through active knowledge construction.

Experiential Learning Theory

Kolb's (1984) Experiential Learning Theory explains that learning develops through concrete experience, reflective observation, abstract conceptualization, and active experimentation. This theory directly supports project-based learning, one of the teaching strategies examined in the study, because students engage in practical tasks, reflect on their performance, understand the principles behind their actions, and apply what they have learned to subsequent activities. In FCS education, these experiences may involve completing practical outputs, following procedures, managing time, and improving the quality of work.

The theory relates to practical skills performance because repeated application and reflection may help students strengthen technical competence, procedural accuracy, productivity, and safety practices. It also relates to workforce readiness because project-based activities may provide opportunities to practice problem-solving, teamwork, communication, and adaptability while completing authentic tasks. However, experiential learning does not automatically guarantee these outcomes; the quality of the activities, feedback, and opportunities for improvement may affect what students learn. Thus, the theory provides a rationale for examining whether project-based learning significantly predicts the two outcomes.

Social Learning Theory

Bandura's (1977) Social Learning Theory emphasizes that individuals can learn by observing others, modeling demonstrated behaviors, and interacting with their social

environment. This theory directly supports the demonstration method, in which teachers model correct procedures, appropriate techniques, and safety practices before students perform tasks themselves. Observing a model can help students understand the sequence of actions and expected standards of performance, which may be reflected in their technical competence, procedural accuracy, and safety practices.

The theory also supports cooperative learning, as students can observe and learn from their peers while sharing responsibilities, exchanging ideas, and working toward common goals. These interactions may provide opportunities to develop communication, teamwork, and professional behavior, which are relevant to workforce readiness. Nevertheless, observation and group participation do not necessarily mean that every learner has mastered a skill or developed the same competencies. Individual performance and the actual quality of participation remain important. Social Learning Theory therefore explains why demonstration and cooperative learning may be associated with both practical skills performance and workforce readiness.

Constructivist Learning Theory

Constructivist Learning Theory, associated with Piaget (1970) and Vygotsky (1978), views learners as active participants in constructing knowledge through experience, prior understanding, problem-solving, and interaction with others. This perspective supports differentiated instruction because students have different levels of readiness, learning needs, and prior experiences. Adjusting tasks, guidance, and learning activities to these differences may help students engage with practical lessons at an appropriate level and progress toward expected competencies.

Constructivist principles also support cooperative and project-based learning, in which students build understanding by discussing ideas, solving practical problems, and applying knowledge to specific tasks. These processes may be associated with improved procedural understanding, technical performance, independent decision-making, and problem-solving.

In relation to workforce readiness, actively constructing knowledge and learning with others may help students practice communication, collaboration, and adaptability. However, the effectiveness of these approaches may depend on the learning environment, instructional support, and opportunities for meaningful participation. The theory therefore provides a basis for examining how differentiated instruction, together with the other selected strategies, relates to the study's outcome variables.

Integration of the Theories

Taken together, the three theories explain complementary processes through which teaching strategies may be related to students' learning outcomes. Experiential Learning Theory explains learning through practical experience and reflection; Social Learning Theory explains learning through observation, modeling, and interaction; and Constructivist Learning Theory explains how students actively develop understanding in response to their experiences, needs, and social environment.

In this study, these theoretical perspectives support the examination of demonstration, cooperative, project-based, and differentiated teaching strategies as the independent variables, and practical skills performance and workforce readiness as the dependent variables. They provide a conceptual explanation for why the selected strategies may be relevant to students' technical competencies and employability skills. The theories do not establish that the strategies necessarily cause improved outcomes; rather, they guide the investigation of whether statistically significant predictive relationships exist among the variables in the context of FCS education at Parañaque National High School-Baclaran.

Conceptual Framework

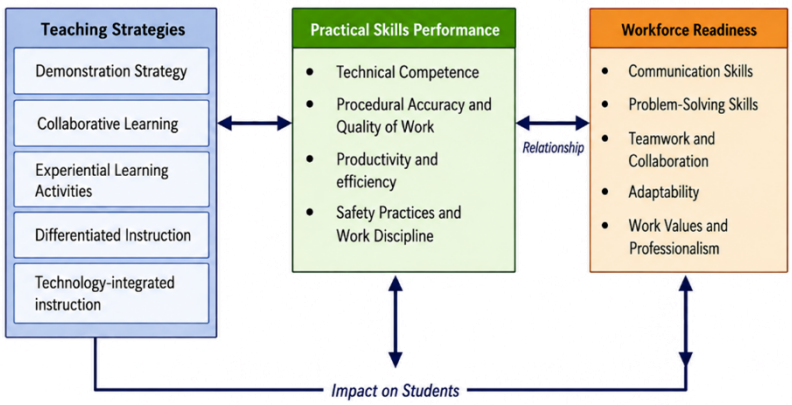


Fig. 1. The Conceptual Framework

This study is anchored on a conceptual framework that explains the relationship between teaching strategies, practical skills performance, and workforce readiness among Grade 11 and Grade 12 students in Family and Consumer Science (FCS) education. The framework presents teaching strategies as the independent variable, while practical skills performance and workforce readiness are treated as dependent variables. It assumes that the way instruction is delivered in the classroom has a direct influence on students' ability to perform hands-on tasks and develop competencies needed in future employment.

The teaching strategies considered in this study include demonstration method, collaborative learning, experiential learning activities, differentiated instruction, and technology-integrated instruction. These strategies are supported by contemporary educational perspectives that emphasize learner-centered and skills-based instruction (OECD, 2020; Tomlinson, 2021). The framework assumes that these instructional approaches provide students with opportunities to observe, participate, collaborate, and apply knowledge in meaningful contexts. For instance, demonstration method allows students to observe correct procedures before performing tasks, while collaborative learning encourages interaction and shared responsibility. Experiential learning activities provide direct engagement with real-life tasks, differentiated instruction addresses learner diversity, and technology-integrated instruction enhances access to information and interactive learning experiences.

The first outcome variable in the framework is practical skills performance, which is measured in terms of technical competence, procedural accuracy and quality of work, productivity and efficiency, and safety practices and work discipline. These indicators reflect students' ability to perform actual tasks in FCS such as food preparation, household management, and other applied activities. According to UNESCO (2022), practical competence involves the integration of knowledge, skills, and attitudes in completing tasks

effectively. In this study, it is assumed that effective teaching strategies enhance students' ability to perform tasks accurately, efficiently, and safely. Repeated exposure to guided instruction, hands-on activities, and feedback is expected to strengthen students' technical abilities and improve the quality of their outputs.

The second outcome variable is workforce readiness, which includes communication skills, problem-solving skills, teamwork and collaboration, adaptability, and work values and professionalism. These competencies are considered essential for employability and success in modern work environments (World Economic Forum, 2023). The framework assumes that instructional strategies that promote interaction, reflection, and real-world application contribute to the development of these skills. For example, collaborative learning enhances teamwork and communication, while experiential and technology-integrated activities promote problem-solving and adaptability. Differentiated instruction, on the other hand, supports the development of responsibility and self-management, which are important aspects of professionalism.

The framework also recognizes the relationship between practical skills performance and workforce readiness. It suggests that students who demonstrate higher levels of technical competence, accuracy, efficiency, and safety practices are more likely to exhibit stronger workforce readiness skills. This means that mastery of practical tasks may contribute to the development of positive work behaviors such as discipline, collaboration, and adaptability. This relationship is supported by previous studies indicating that hands-on skill development is closely linked to employability outcomes (Darling-Hammond et al., 2020; World Economic Forum, 2023).

Overall, the conceptual framework illustrated a structured relationship in which teaching strategies influence practical skills performance and workforce readiness, while practical skills performance also contributes to workforce readiness. This model provides the basis for analyzing how instructional practices in FCS education affect student outcomes. It

further guides the selection of variables, research instruments, and statistical procedures used in this study, ensuring that the investigation remains focused on understanding how classroom instruction translates into both technical competence and employability development among senior high school learners.

Research Gap and Justification

Previous studies have established the importance of effective teaching strategies in improving students' learning experiences and practical competencies in technical-vocational education. However, the existing literature reviewed for this study provides limited localized evidence on how these specific teaching strategies are statistically associated with both practical skills performance and workforce readiness among senior high school students enrolled in Family and Consumer Science (FCS) subjects.

A major gap in the reviewed literature is the limited integration of these two outcomes; practical skills and workforce readiness, within a single investigation. Examining only one outcome may therefore provide an incomplete understanding of how instructional practices support students' preparation for employment.

Another gap concerns the predictive relationships among the variables. Consequently, the reviewed literature does not sufficiently establish which of the selected teaching strategies significantly predict practical skills performance and workforce readiness within the specific context of FCS education at the senior high school level.

To address these gaps, the present study investigated the predictive relationships between the four teaching strategies and two distinct outcomes: practical skills performance and workforce readiness. The study sought to determine whether the identified teaching strategies significantly predicted these outcomes in the study setting.

The study's specific contribution was its localized and integrated examination of four teaching strategies in relation to both practical skills performance and workforce readiness

among FCS learners in one public senior high school. Its findings provided an empirical basis for developing the Teaching Strategies Enhancement Framework for Strengthening Practical Skills Performance and Workforce Readiness in Family and Consumer Science Education. The resulting framework may help teachers and school administrators make more evidence-informed instructional decisions and strengthen the alignment between practical learning workplace competencies. In this way, the study contributes context-specific evidence to discussions on improving the quality and relevance of skills-based education in the Philippines.

Relevance to the Current Study

Previous research suggests that demonstration, cooperative learning, project-based learning, and differentiated instruction can promote active participation, guided practice, collaboration, and problem-solving (OECD, 2020; Tomlinson, 2021). The literature also identified practical skills performance and workforce readiness as distinct but related educational outcomes.

However, what remains insufficiently understood is whether the specific teaching strategies examined in this study significantly predict both practical skills performance and workforce readiness among senior high school students in FCS education.

The theoretical foundations of the study further explained these relationships. Kolb's (1984) Experiential Learning Theory supported the role of practical experience and reflection in developing skills through project-based activities. Bandura's (1977) Social Learning Theory may support learning through demonstration and cooperative activities. Constructivist perspectives, Vygotsky's (1978) provided a basis for understanding how collaborative and appropriately differentiated learning experiences may support competency development.

The present study was therefore necessary to address this context-specific empirical gap and generated localized evidence on the statistical predictive relationships among these variables without assuming direct causation.

Ultimately, the study contributed context-specific evidence efforts to improve skills-based education, consistent with Sustainable Development Goal 4 on quality education (UNESCO, 2022) and Philippine priorities for strengthening senior high school learning and workforce preparation.

Purpose of the Study

This study aimed to determine how teaching strategies predict the practical skills performance and workforce readiness of Grade 11 and Grade 12 students in Family and Consumer Science (FCS) education at Parañaque National High School-Baclaran. It specifically examined the influence of instructional approaches on students' technical competence, procedural accuracy, productivity, safety practices, communication skills, problem-solving abilities, teamwork, adaptability, and professionalism. The study also sought to identify whether teaching strategies used in FCS classes contributed to students' preparedness for practical work and future employment opportunities. Using a quantitative predictive-correlational research design, data were collected from students enrolled in FCS subjects during the academic year 2025–2026. The findings were expected to provide useful information that would help improve instructional practices and strengthen practical skills development and workforce readiness among senior high school learners.

Significance of the Study

The significance of this study lies in its potential to contribute to the improvement of teaching and learning practices in Family and Consumer Science (FCS) education. By examining the relationship between teaching strategies, practical skills performance, and workforce readiness, the study may provide valuable information that can help strengthen instructional practices and better prepare learners for real-life situations and future employment.

For teachers. The findings may serve as a guide in selecting and improving instructional approaches that encourage active participation and skill development among students. The

study may also help teachers identify strategies that effectively support learners with different abilities and learning needs.

School heads and administrators. They may benefit from the results by using the findings to support instructional supervision, teacher development programs, and curriculum improvement initiatives. The study may also assist schools in aligning classroom practices with industry expectations and workforce demands.

Industry partners. They may gain insights into the current competencies and skill gaps of senior high school learners. Their participation can help strengthen the connection between school-based instruction and workplace requirements.

For future researchers. the study may serve as a useful reference for further investigations related to teaching strategies, practical skills, and workforce preparation in technical-vocational education. Moreover, the study supports the promotion of quality and relevant education by encouraging the development of competent, skilled, and work-ready learners.

Scope and Delimitations

This study focused on the relationship between teaching strategies, practical skills performance, and workforce readiness among Grade 11 and Grade 12 students enrolled in Family and Consumer Science (FCS) subjects at Parañaque National High School-Baclaran during the academic year 2025–2026. The research examined selected instructional strategies commonly applied in FCS classes and their influence on students' practical competencies and employability-related skills.

The study used a quantitative predictive-correlational research design and gathered data through survey questionnaires administered to student respondents. The investigation was limited to one public senior high school and did not include students from other academic tracks or institutions. Variables such as socioeconomic background, parental involvement,

and prior academic achievement were excluded from the study. Likewise, classroom observations, interviews, and experimental interventions were not included, as the study relied primarily on quantitative self-reported data.

Definition of Terms

The following terms were defined operationally as they are used in this study:

Communication Skills. This referred to students' ability to clearly express ideas, listen actively, and interact appropriately with peers and teachers during FCS activities, as measured through a structured Likert-scale questionnaire.

Collaborative Learning. This referred to instructional practices where students work in small groups to accomplish shared tasks in FCS lessons, as perceived by Grade 11 and Grade 12 respondents using survey items.

Demonstration Strategy. This referred to the teaching strategy where the teacher models step-by-step procedures for practical FCS tasks before student execution, as rated by student respondents.

Differentiated Instruction. This referred to instructional adjustments made by the teacher to accommodate learners' varying abilities, readiness levels, and learning needs, as measured through student responses.

Experiential Learning Activities. This referred to hands-on and real-life learning tasks in FCS where students actively perform activities to develop skills, as reflected in questionnaire responses.

Procedural Accuracy and Quality of Work. This referred to the extent to which students correctly follow steps and produce outputs that meet expected standards in practical tasks, as assessed through self-reported survey items.

Problem-Solving Skills. This referred to students' ability to identify issues, analyze situations, and apply appropriate solutions during FCS activities, as measured through a questionnaire.

Productivity and Efficiency. This referred to students' ability to complete practical tasks within the required time while maximizing effort and minimizing waste of resources, as measured through survey responses.

Safety Practices and Work Discipline. This referred to students' compliance with safety rules, proper use of tools, cleanliness, and adherence to classroom regulations during practical work, as assessed through questionnaire items.

Technical Competence. This referred to students' ability to correctly use tools, materials, and procedures in performing FCS tasks, as measured through self-assessment responses.

Technology-Integrated Instruction. This referred to the use of digital tools, multimedia resources, and technology-based materials in teaching FCS lessons, as perceived by student respondents.

Teamwork and Collaboration. This referred to students' ability to work cooperatively, share responsibilities, and contribute effectively to group tasks, as measured through survey responses.

Teaching Strategies. This referred to instructional approaches used in FCS classes, including demonstration, cooperative learning, experiential learning activities, differentiated instruction, and technology-integrated instruction, as rated by students.

Work Values and Professionalism. This referred to students' demonstration of responsibility, discipline, honesty, and respect for rules in accomplishing tasks, as measured through questionnaire responses.

Workforce Readiness. This referred to students' preparedness for employment as reflected

in their communication skills, problem-solving ability, teamwork, adaptability, and work values, as measured through a structured Likert-scale instrument.

LITERATURE REVIEW

Thematic Review of Related Literature

Teaching Strategies in Family and Consumer Science Education

Teaching strategies are important in Family and Consumer Science (FCS) education because learners must develop not only conceptual understanding but also the ability to apply knowledge in practical and workplace-related situations. The Organisation for Economic Co-operation and Development (OECD, 2020) emphasizes active participation, collaboration, critical thinking, and practical application as important features of effective instruction. However, the effectiveness of teaching strategies should not be understood as universal. Different approaches may develop different competencies, and their outcomes may depend on the quality of implementation, available resources, and opportunities for practice.

Demonstration, for instance, provides students with a model of correct procedures before they perform tasks independently. Hattie (2023) highlights the value of demonstration in helping learners understand task execution. This approach is particularly relevant to FCS activities that require procedural accuracy, technical competence, and compliance with safety practices. Nevertheless, observing a teacher perform a task does not necessarily mean that students can reproduce it independently. Demonstration therefore needs to be considered alongside opportunities for guided practice, feedback, and individual performance.

Cooperative learning offers a different contribution by allowing students to exchange ideas, share responsibilities, and complete tasks collaboratively. Its potential value extends beyond technical learning to communication and teamwork, which are also components of workforce readiness. However, the benefits of group activities may be uneven when

participation is unequal, or responsibilities are not clearly assigned. This suggests that the presence of cooperative activities alone is insufficient to establish whether students develop the competencies expected from them.

Kolb (2015) explains that experiential learning involves gaining knowledge through experience, reflection, and application, while Condliffe et al. (2021) discuss the potential of experiential and project-based learning to develop problem-solving and higher-order thinking. These approaches give students opportunities to apply knowledge to practical tasks rather than merely recall information. Yet their effectiveness may be constrained by limited time, instructional resources, and classroom-management demands. The literature therefore suggests that project-based learning may support both practical performance and workplace-related competencies, but the extent of its contribution needs to be examined in the actual instructional context.

Differentiated instruction addresses learner diversity by adjusting activities, methods, and assessments according to students' readiness, interests, and needs (Tomlinson, 2021). This approach may help learners with different levels of prior knowledge participate in practical activities and progress toward expected competencies. However, its implementation may be difficult in large classes with limited materials and preparation time. Technology-integrated instruction, discussed by (Mishra & Koehler ,2020), may provide additional learning opportunities through digital demonstrations and instructional resources, but unequal access to technology can limit its application.

Taken together, the literature indicates that teaching strategies offer complementary rather than interchangeable benefits. Demonstration emphasizes modeling and procedural understanding; cooperative learning promotes interaction and shared responsibility; project-based learning emphasizes application and problem-solving; and differentiated instruction responds to differences in learners' needs. Technology integration also provides useful instructional possibilities, although it is not one of the four principal teaching-strategy

variables examined in the present study. Importantly, evidence that these approaches support learning in general does not establish which strategies significantly predict practical skills performance and workforce readiness among FCS learners in a specific public senior high school. This distinction provides a basis for examining the four selected strategies in relation to both outcomes.

Practical Skills Performance in Family and Consumer Science

Practical skills performance concerns the application of knowledge and techniques in completing tasks accurately, efficiently, and safely. UNESCO (2022) emphasizes the integration of knowledge, technical ability, and appropriate attitudes in demonstrating competence. In FCS education, practical performance can be examined through technical competence, procedural accuracy and quality of work, productivity and efficiency, and safety practices and work discipline.

The literature on technical competence emphasizes the importance of guided instruction and repeated practice. Darling-Hammond et al. (2020) discuss the role of instruction and practice in developing learners' competencies. However, practical performance involves more than familiarity with a procedure. Students must also produce acceptable outputs, follow the correct sequence of operations, manage time, and maintain safety standards. These dimensions are related but not identical: a student may understand a procedure yet complete it inaccurately or produce an acceptable output without consistently following safe work practices.

The literature also indicates that performance is influenced by instructional conditions. Clear directions, feedback, sufficient practice time, and access to appropriate materials may support accuracy and quality, while limited resources and restricted opportunities for practice may constrain performance. The International Labour Organization (2021) emphasizes the importance of safety in technical training. The studies cited in the original review, including Zakaria et al. (2023), Jandari et al. (2020), and Magallanes (2025),

further direct attention to structured instruction, safety routines, supervision, and work discipline. Collectively, these discussions suggest that practical competence should be understood as a combination of technical execution, work quality, efficiency, and safe behavior rather than as a single measure of task completion.

Nevertheless, favorable practical performance does not necessarily demonstrate that students are prepared for the wider demands of employment. Technical performance is one part of workplace preparation, while employers also expect learners to communicate effectively, work with others, respond to problems, and demonstrate professionalism. This distinction supports the present study's decision to examine practical skills performance separately from workforce readiness while investigating whether both are statistically predicted by the same teaching strategies.

Workforce Readiness and Employability Skills

Workforce readiness encompasses the competencies and work-related behaviors that help individuals participate effectively in employment. The World Economic Forum (2023) identifies communication, collaboration, adaptability, and problem-solving as important competencies alongside technical expertise. The National Association of Colleges and Employers (2022) also highlights the importance of professional behavior and work-related values. These perspectives indicate that preparation for employment requires more than technical proficiency.

The teaching strategies reviewed offer different opportunities for developing these competencies. Cooperative learning can provide situations in which students communicate, coordinate responsibilities, and work toward shared goals. Project-based activities can require learners to make decisions, respond to difficulties, and manage tasks within given constraints. Demonstration can clarify expected procedures and standards of conduct, while differentiated instruction can provide varied forms of support that enable learners to participate in practical work. However, the presence of these activities does not automatically establish that learners

can transfer the competencies developed in class to workplace situations.

This is an important distinction because technical skills and employability skills may develop at different rates. A student may complete a practical task competently but struggle to explain decisions, collaborate effectively, or adapt when circumstances change. Conversely, a student may communicate and cooperate well but still require support to meet technical standards. Therefore, workforce readiness should not be treated as an automatic consequence of practical skills performance. Examining the two outcomes independently allows the study to investigate whether the selected teaching strategies have predictive relationships with each outcome.

Review of Empirical Studies

Teaching Strategies and Learning Outcomes in Family and Consumer Science Education

Recent empirical studies have emphasized the significant role of teaching strategies in improving both academic achievement and practical skills performance among learners in technical-vocational education. In Family and Consumer Science education, instructional approaches are expected to support the development of technical competence, work discipline, and employability skills needed in workplace settings. Several studies indicate that learner-centered teaching strategies contribute positively to students' engagement, participation, and skill acquisition.

Garcia et al. (2023) found that student-centered instructional approaches, particularly collaborative learning and experiential learning activities, improved learners' classroom participation and practical task performance in technical subjects.

Similarly, Santos & Reyes (2021) reported that the demonstration method combined with guided practice produced positive effects on students' procedural accuracy and quality of

work. The study further revealed that demonstration was particularly effective in developing technical competence because learners were given visual and step-by-step guidance before engaging in independent work.

The findings of Hidalgo et al. (2025) reveal that Demonstration, Lecture-Based Discussions, and Laboratory-Based Learning are the most effective strategies, positively correlating with student competency outcomes. Approximately 73% of 890 assessed students achieved competency, highlighting the significance of hands-on and learner-centered approaches. However, innovative methods such as flipped classrooms and virtual laboratories were underutilized, underscoring gaps in resource allocation and teacher training.

Research on collaborative learning also highlights its contribution to the development of teamwork and collaboration skills. According to Villanueva & Cruz (2022), students who participated in collaborative learning activities demonstrated improved communication skills and stronger interpersonal relationships. These findings suggest that collaborative learning not only influences academic outcomes but also contributes to workforce readiness competencies.

Research on experiential learning, in a study conducted by Ramos et al. (2023), found that learners exposed to laboratory activities, simulations, and project-based tasks demonstrated higher levels of problem-solving skills and adaptability compared to students who experienced lecture-based instruction alone. Students also became more independent and resourceful when tasked with solving real-life problems during practical activities.

Differentiated instruction has also received attention in recent educational research. Mendoza (2022) observed that students performed better in practical activities when teachers adjusted instruction according to learners' needs and readiness levels. Learners who received modified tasks and additional instructional support showed improvements in confidence, participation, and task completion. However, the study also pointed out that implementing differentiated instruction became difficult in overcrowded classrooms where teachers handled

diverse learners with limited time and resources.

Technology-integrated instruction has increasingly been explored in technical-vocational education. De Guzman & Torres (2024) found that the use of instructional videos, multimedia presentations, and online demonstrations enhanced learner engagement and supported practical understanding among senior high school students. Students exposed to technology-assisted instruction showed higher levels of motivation and adaptability because digital resources allowed them to review lessons independently. The study also revealed that technology integration improved communication and information-sharing among learners. However, inadequate internet access and limited technological resources remained major challenges in some public schools.

The modern industrial-pedagogical frameworks from Accellier Education (2024), outline that technology integration accelerates productivity benchmarks in vocational layouts. Pre-exposure to automated digital frameworks trains students to think in terms of streamlined processing sequences, reducing manual calculation times and minimizing physical tool transition overhead.

Despite the positive findings associated with various teaching strategies, some empirical studies suggest that instructional approaches alone may not fully explain learning outcomes. Lopez (2022) argued that the effectiveness of teaching strategies depends largely on contextual factors such as teacher competence, classroom management, learning resources, and class size. The study emphasized that even effective instructional methods may produce limited results when schools lack adequate facilities and instructional materials. These findings suggest that successful implementation of teaching strategies requires supportive learning environments and institutional support.

Practical Skills Performance

Empirical studies consistently show that practical skills performance is influenced by instructional quality, frequency of practice, and learner engagement.

Cruz (2022) found that students who received regular feedback during practical activities demonstrated higher levels of technical competence and procedural accuracy. Learners improved their ability to use tools correctly and follow proper procedures when teachers provided immediate corrections and guidance during task performance.

Bautista (2023) reported that clear performance standards contributed significantly to productivity and efficiency among learners in technical-vocational subjects. The study further revealed that organized classroom routines and time-management practices improved learners' efficiency during laboratory activities.

Research on safety practices and work discipline, according to Navarro & Perez (2021), learners who were consistently oriented on laboratory rules and workplace standards demonstrated greater responsibility and awareness during practical activities. The researchers emphasized that safety consciousness should be integrated into everyday classroom instruction to prepare students for actual work environments.

Bascuguin et al. (2026) found that significant associations were obtained between project-based learning and sex, CSS specialization, and NC possession; collaborative learning and NC possession; and problem-based learning and specialization and NC possession. These align with Carol Ann Tomlinson's Differentiated Instruction Framework, which contends that modifying content, process, and product according to a learner's readiness level maximize individual potential.

In another study, Dizon et al. (2024) observed that students' practical skills performance varied depending on access to laboratory facilities and instructional resources. Learners from schools with adequate equipment and materials demonstrated stronger technical competence and higher-quality outputs compared to students from under-resourced schools. The study suggested that instructional effectiveness is closely connected to the availability of facilities that support hands-on learning experiences.

Although many studies report positive outcomes in practical skills development,

several researchers also note inconsistencies in student performance. Reyes & Aquino (2022) found that some learners performed well during guided activities but struggled when asked to complete tasks independently. This finding indicates that skill mastery may require more opportunities for independent practice, reflection, and application beyond teacher-led instruction.

Workforce Readiness

Workforce readiness has become a major focus of recent educational research due to increasing employer expectations for both technical and soft skills.

Dela Cruz et al. (2024) found that students exposed to collaborative and problem-based learning activities demonstrated improved communication skills and teamwork abilities. The study concluded that classroom interaction plays an important role in developing workplace communication competencies.

Problem-solving skills were also found to improve through experiential learning approaches. According to Fernandez (2023), learners who participated in inquiry-based and project-based activities became more analytical and resourceful when responding to practical challenges.

Adaptability has likewise emerged as an important employability skill. In a study by Torres & Lim (2022), students exposed to technology-integrated instruction and varied classroom activities demonstrated greater flexibility in adjusting to new tasks and learning environments. The researchers explained that exposure to different learning situations helps learners become more open to change and capable of handling unfamiliar responsibilities.

Mercado & Salonga (2021) observed that students who practiced punctuality, responsibility, discipline, and accountability during school activities demonstrated more positive attitudes toward work-related tasks. Employers who participated in the study identified professionalism and work ethic as important qualities among entry-level workers.

However, several empirical studies continue to report gaps between school preparation and industry expectations. Industry-based assessments conducted by Ramos & Diaz (2023) revealed that while many learners possessed basic technical knowledge, some lacked independence, initiative, and confidence in actual work situations. These findings suggest that schools need to strengthen instructional practices that integrate both technical competencies and employability skills.

Methodological Trends and Contexts

Most empirical studies related to teaching strategies, practical skills performance, and workforce readiness use quantitative research designs involving surveys, assessments, and correlational analysis. According to Ramos (2023), quantitative approaches are commonly used because they allow researchers to measure relationships among instructional practices and learning outcomes. However, some scholars recommend combining quantitative and qualitative methods to provide deeper understanding of learners' experiences and classroom realities.

In terms of research context, many existing studies focus on urban schools or institutions with relatively adequate resources. Limited research has been conducted in public senior high schools, particularly in Family and Consumer Science education. This gap highlights the need for context-specific studies that examine how teaching strategies influence practical skills performance and workforce readiness among Grade 11 and Grade 12 learners in public school settings.

RESEARCH QUESTIONS

This study aimed to determine whether teaching strategies significantly predict practical skills performance and workforce readiness in Family and Consumer Science (FCS) education among Grade 11 and Grade 12 students at Parañaque National High School-Baclaran.

Specifically, this study sought to answer the following questions:

1. What is the level of teaching strategies employed in Family and Consumer Science classes as perceived by Grade 11 and Grade 12 students in terms of:

   1.1 Demonstration Strategy;

   1.2 Collaborative Learning

   1.3 Experiential Learning Activities

   1.4 Differentiated Instruction; and

   1.5 Technology-integrated Instruction

2. What is the level of practical skills performance of Grade 11 and Grade 12 students in terms of:

   2.1 Technical Competence

   2.2 Procedural Accuracy and Quality of Work

   2.3 Productivity and efficiency; and

   2.4 Safety Practices and Work Discipline

3. What is the level of workforce readiness of Grade 11 and Grade 12 students in terms of:

   3.1 Communication Skills

   3.2 Problem-Solving Skills

   3.3 Teamwork and Collaboration

   3.4 Adaptability; and

   3.5 Work values and Professionalism

4. Is there a significant relationship between teaching strategies and practical skills performance of Grade 11 and 12 students?

5. Is there a significant relationship between teaching strategies and workforce readiness of Grade 11 and 12 students?

6. Do teaching strategies significantly predict the practical skills performance of Grade 11 and 12 students?

7. Do teaching strategies significantly predict the workforce readiness of Grade 11 and 12 students?

8. Is there a significant difference between the assessments of Grade 11 and Grade 12 students regarding:

   8.1 Teaching strategies

   8.2 Practical skills performance; and

   8.3 Workforce readiness

Hypotheses

The following null hypotheses will be statistically tested based on the stated research problems:

1. $\mathbf{H_{01}}$: There is no significant relationship between teaching strategies and practical skills performance of Grade 11 and Grade 12 students.

2. $\mathbf{H_{02}}$: There is no significant relationship between teaching strategies and workforce readiness of Grade 11 and Grade 12 students.

3. $\mathbf{H_{03}}$: Teaching strategies do not significantly predict the practical skills performance of Grade 11 and Grade 12 students.

4. **H_{04}**: Teaching strategies do not significantly predict the workforce readiness of Grade 11 and Grade 12 students.

5. **H_{05}**: There is no significant difference in the assessments of Grade 11 and Grade 12 students regarding practical skills performance.

6. **H_{06}**: There is no significant difference in the assessments of Grade 11 and Grade 12 students regarding workforce readiness.

METHODOLOGY

This describes the methodological procedures employed in the conduct of the study. It presents the research design, population and sampling procedures, research locale, instrumentation, data gathering procedures, statistical treatment of data, and ethical considerations observed throughout the research process. The chapter explains how the selected methods and procedures align with the research questions or hypotheses and the conceptual framework of the study. By clearly outlining these methodological components, this chapter demonstrates the systematic and rigorous approach undertaken to ensure the validity, reliability, and integrity of the research findings.

Research Design

This study utilized a quantitative, non-experimental predictive-correlational research design. This design was considered appropriate because the study aimed to determine the extent to which teaching strategies are related to and predict the practical skills performance and workforce readiness of Grade 11 and Grade 12 students in FCS education, without manipulating any of the variables involved. As emphasized by Creswell & Creswell (2018), correlational research is suitable for examining relationships among variables as they naturally occur in real-world settings, while predictive designs extend this by identifying the

degree to which one variable can forecast outcomes in another.

In this study, the correlational component was used to determine whether significant relationships exist between the identified teaching strategies and student outcomes. Specifically, it examined the relationship between demonstration method, collaborative learning, experiential learning activities, differentiated instruction, and technology-integrated instruction, and the two dependent variables: practical skills performance and workforce readiness. Practical skills performance was assessed in terms of technical competence, procedural accuracy and quality of work, productivity and efficiency, and safety practices and work discipline. Workforce readiness, on the other hand, was measured in terms of communication skills, problem-solving skills, teamwork and collaboration, adaptability, and work values and professionalism.

Meanwhile, the predictive component of the design employed regression analysis to determine the extent to which teaching strategies can predict variations in students' practical skills performance and workforce readiness. This allowed the study to go beyond simple association and provide empirical evidence on the relative contribution of each instructional strategy to student outcomes.

The study primarily gathered quantitative data through structured survey questionnaires administered to Grade 11 and Grade 12 students enrolled in FCS subjects at Parañaque National High School-Baclaran during the academic year 2025–2026. The use of a quantitative approach ensured that the data collected were measurable, comparable, and suitable for statistical analysis, thereby increasing the objectivity of the findings.

The design aligned with the conceptual framework of the study, where teaching strategies functioned as independent variables, while practical skills performance and workforce readiness served as dependent variables. This alignment allowed for a systematic examination of how instructional practices influence learner outcomes in FCS education. The findings generated through this design were expected to provide evidence-based insights that

may support instructional improvement and contribute to the development of an enhancement framework for teaching strategies in skills-based education, consistent with the goals of UNESCO (2022).

Variables and Operational Definitions

This study included three main variables: teaching strategies (independent variable), and dependent variables: practical skills performance and workforce readiness.

The independent variable, teaching strategies, referred to the instructional approaches employed in FCS classes as perceived by Grade 11 and Grade 12 students. It was measured using a structured survey questionnaire rated through a Likert scale. It was composed of four indicators. Demonstration method which teachers show step-by-step procedures. Collaborative learning was structured group activities that promote collaboration. Experiential learning activities referred to hands-on tasks and real-life application. Differentiated instruction was measured in terms of instructional adjustments based on learner needs. Technology-integrated instruction referred to the use of digital tools and multimedia resources in teaching.

The first dependent variable, practical skills performance, referred to the level of students' ability to perform FCS-related tasks effectively. It was also measured using a Likert-scale questionnaire based on student self-assessment. It had four indicators: Technical competence was the ability to properly use tools and perform tasks. Procedural accuracy and quality of work measured correctness and standard of outputs. Productivity and efficiency referred to task completion within appropriate time and resource use. Safety practices and work discipline referred to compliance with safety procedures, cleanliness, and responsible behavior during practical activities.

The second dependent variable, workforce readiness, referred to the extent of students' preparedness for employment and workplace demands. It was measured through indicators such as communication skills refer to clarity in expressing ideas and instructions. Problem-

solving skills measured the ability to analyze and resolve task-related challenges. Teamwork and collaboration referred to cooperation in group activities. Adaptability referred to flexibility in handling new tasks and situations. Work values and professionalism referred to discipline, responsibility, and ethical behavior.

Teaching strategies were expected to influence both practical skills performance and workforce readiness.

Population and Sampling Techniques

The population of this study consisted of all Grade 11 and Grade 12 students enrolled in the Family and Consumer Science specialization at Parañaque National High School–Baclaran during School Year 2025–2026 who met the eligibility criteria for participation in the study.

Based on official school enrollment records, the accessible population consisted of 87 Grade 11 students and 81 Grade 12 students, for a total of 168 students. Given the manageable size of the population and the accessibility of its members, the researcher adopted a census approach using complete enumeration, whereby all eligible members of the accessible population were invited to participate in the study.

The use of a census approach was supported by the definition provided by the Australian Bureau of Statistics (2023), which described a census as the study of every unit in a defined population, also referred to as complete enumeration.

MacDonald (2020) explained that census methodology involves enumerating every individual within a specified geographical area and population at a defined point in time.

The census approach was appropriate because the study aimed to examine the relationships and predictive effects of teaching strategies on practical skills performance and workforce readiness among FCS students at the research locale. By inviting all 168 eligible students to participate, the researcher sought to obtain comprehensive data representing the

accessible student population.

The collected data were analyzed using appropriate statistical techniques, including the Pearson Product-Moment Correlation and Multiple Regression Analysis. Although complete enumeration avoids sampling error associated with selecting only a subset of the defined population, it does not eliminate possible nonresponse, measurement error, or response bias. Furthermore, the findings were interpreted primarily in relation to the accessible population and the specific school context in which the study was conducted.

The responses obtained through the researcher-developed questionnaire provided information about students' perceptions of teaching strategies, self-assessed practical skills performance, and perceived workforce readiness. These data served as the basis for examining the relationships among the study variables while recognizing the limitations associated with self-reported measurements.

Research Locale

This study was conducted at Parañaque National High School–Baclaran that offers Family and Consumer Science (FCS) subjects under the Technical-Vocational-Livelihood (TVL) track. The school serves Grade 11 and Grade 12 learners who are enrolled in FCS-related subjects that emphasize practical skills development through both classroom instruction and hands-on activities.

The selected research locale was appropriate because it provided direct access to students who were actively exposed to a variety of teaching strategies. The school setting reflected a typical public senior high school environment where instructional delivery was influenced by factors such as class size, resource availability, and learner diversity.

In addition, the locale offered a relevant context for examining how teaching strategies influence students' practical skills performance and workforce readiness. Conducting the study in this setting allowed for a more accurate assessment of actual classroom practices and

student outcomes within FCS education.

Instrumentation

Description of Instruments

This study utilized a researcher-developed structured questionnaire as the primary data-gathering instrument to obtain quantitative data from Grade 11 and Grade 12 students enrolled in Family and Consumer Science (FCS) subjects at Parañaque National High School-Baclaran. The questionnaire measured three major variables aligned with the research objectives: teaching strategies, self-assessed practical skills performance, and perceived workforce readiness.

The questionnaire consisted of three parts. Part I measured students' perceptions of the teaching strategies employed in FCS instruction, specifically demonstration strategy, collaborative learning, experiential learning activities, differentiated instruction, and technology-integrated instruction. Part II assessed students' self-perceptions of their practical skills performance in terms of technical competence, procedural accuracy and quality of work, productivity and efficiency, and safety practices and work discipline. Part III measured students' perceived workforce readiness in terms of communication skills, problem-solving skills, teamwork and collaboration, and work values and professionalism.

Each item was rated using a four-point Likert scale to indicate the extent to which the statements reflected the respondents' experiences or perceived competencies. The scale consisted of 4 – To a Great Extent, 3 – To a Moderate Extent, 2 – To a Lesser Extent, and 1 – To a Very Lesser Extent. The absence of a neutral midpoint encouraged respondents to indicate the extent of their agreement with or perception of each statement.

The questionnaire items were developed based on relevant literature, empirical studies, and the theoretical and conceptual frameworks of the study. The items were intended

to capture students' experiences of FCS instructional practices, their perceptions of their practical skills, and their perceived preparedness for future employment.

It is important to clarify that practical skills performance was measured through student self-assessment rather than independent observation or performance-based evaluation. Consequently, the findings pertaining to practical skills performance were interpreted as students' perceived or self-assessed competencies and not as direct, objective verification of their actual performance in practical tasks.

Validity and Reliability Measures

To establish content validity, the questionnaire was submitted to at least three experts in FCS education and research methodology for evaluation. The experts examined the clarity, relevance, appropriateness, and alignment of the items with the study variables and research objectives. Their recommendations were incorporated into the instrument before its administration.

A pilot test was conducted among students with characteristics similar to those of the target respondents but who were not included in the actual study. The internal consistency of each multi-item construct was examined separately using Cronbach's alpha. Separate reliability coefficients were determined for teaching strategies, self-assessed practical skills performance, and perceived workforce readiness, as well as for their respective subscales when appropriate. A coefficient of 0.70 or higher was considered a general indicator of acceptable internal consistency. The results were evaluated in consideration of the number of items and the conceptual consistency of each construct. Items that required clarification or revision were addressed before final administration.

The study recognized the possibility of common method bias because teaching strategies, self-assessed practical skills performance, and perceived workforce readiness were

measured through the same student self-report questionnaire. To minimize this risk, the questionnaire used clear and concise statements, distinct sections for each construct, and non-leading wording. Respondents were encouraged to answer honestly based on their actual learning experiences and perceptions.

These procedural measures were intended to reduce response-related bias but could not completely eliminate common method bias. Accordingly, the relationships and predictive effects identified in the study were interpreted with caution, recognizing that shared measurement methods and self-reporting may have influenced the observed associations.

Overall, the instrument provided quantitative data on students' perceptions of teaching strategies, their self-assessed practical skills performance, and their perceived workforce readiness in FCS education. The findings were interpreted within the scope and limitations of self-reported measurements.

Data Gathering Procedure

Prior to the actual data collection, the researcher sought formal approval from the school administration of Parañaque National High School–Baclaran and secured the necessary research permits required by the division office. Once approval was granted, coordination with the FCS subject teachers was undertaken to identify the Grade 11 and Grade 12 student-respondents who were officially enrolled in Family and Consumer Science subjects for the academic year 2025–2026.

After the identification of respondents, the researcher conducted an orientation to explain the purpose of the study, its significance, and the voluntary nature of participation. Informed consent was secured from the respondents, and assurance was given that all responses would be treated with strict confidentiality and used solely for academic purposes.

The structured questionnaire was then administered to the selected respondents.

Depending on the school's preferred arrangement and the availability of students, the instrument was distributed either in printed form during class schedules or through a secure online platform. Clear instructions were provided before the administration to ensure that respondents fully understood how to complete the questionnaire. Adequate time was allotted for students to answer all items carefully and honestly without pressure.

After retrieval, all completed questionnaires were checked for completeness and consistency. Incomplete or invalid responses were excluded from the final data set to ensure accuracy of results. The collected data was then systematically encoded, organized, and prepared for statistical analysis in accordance with the research objectives. This procedure ensured that data gathering was conducted in an orderly, ethical, and reliable manner consistent with the requirements of quantitative research.

Ethical Considerations

This study observed the ethical standards required in conducting research involving human participants, particularly students. Participation in the study was entirely voluntary, and respondents were not compelled to take part. They were informed that they may refuse to answer any item or withdraw from the study at any stage without any form of penalty or negative consequence.

Informed consent was secured prior to the administration of the questionnaire, with clear explanation of the purpose of the study, the nature of their participation, and how the data will be used. For student respondents who were minors, appropriate permission was obtained in accordance with school guidelines and ethical research protocols.

Confidentiality and anonymity were strictly observed throughout the study. No names, student numbers, or any identifying information were collected or disclosed in any part of the research output. All responses were encoded and reported in aggregated form to ensure that

individual participants cannot be identified.

The researcher also complied with the provisions of the Data Privacy Act of 2012 (Republic Act No. 10173) by ensuring that all collected data were securely stored, properly protected, and accessed only for academic research purposes. After completion of the study and required analysis, all raw data were safely retained or disposed of in accordance with institutional guidelines.

Overall, the study ensured respect for participants' rights, dignity, and privacy while maintaining integrity and transparency in the research process.

Data Management and Data Analysis Procedures

After data collection, all questionnaire responses were systematically encoded, coded, and organized for analysis. The data were checked for completeness and consistency, and incomplete responses were excluded to ensure accuracy. The final dataset was processed using statistical software such as SPSS.

Descriptive Statistics

Descriptive statistical procedures were employed to summarize and describe the characteristics of the collected data. Since the study involved Grade 11 and Grade 12 students enrolled in Family and Consumer Science (FCS), frequency counts and percentages were used to describe the distribution of respondents according to grade level. Mean and weighted mean were utilized to determine the level of teaching strategies employed in FCS classes as perceived by the respondents, as well as the levels of practical skills performance and workforce readiness among the students. These measures of central tendency provided an overall description of the respondents' perceptions and assessments regarding the variables under investigation. Standard deviation was used to determine the variability or dispersion of responses around the mean, indicating the degree of consistency or variation in participants'

responses.

Inferential Statistics

For inferential analysis, the Pearson Product-Moment Correlation Coefficient (Pearson r) was used to determine the significant relationship between teaching strategies and practical skills performance, as well as between teaching strategies and workforce readiness. Multiple regression analysis was employed to assess whether the identified teaching strategies significantly predict students' practical skills performance and workforce readiness.

Furthermore, an independent samples t-test was used to determine whether there are significant differences in the responses of Grade 11 and Grade 12 students in terms of teaching strategies, practical skills performance, and workforce readiness. All statistical tests were interpreted at a 0.05 level of significance ($\alpha = 0.05$).

This systematic approach to data management and analysis ensured that the results are statistically valid, reliable, and aligned with the research objectives of the study.

FINDINGS

This presents a concise summary of the major findings of the study based on the results of the statistical analyses discussed in the preceding chapters. The findings are organized according to the research questions stated in Chapter 1 to provide a clear synthesis of the results obtained from the study.

1. Level of teaching strategies employed in Family and Consumer Science classes as perceived by Grade 11 and Grade 12 students in terms of Demonstration Strategy, Collaborative Learning, Experiential Learning Activities, Differentiated Instruction, and Technology-integrated Instruction. The analysis showed that the overall level of teaching strategies in terms of Demonstration Strategy, Collaborative Learning, Experiential Learning Activities,

Differentiated Instruction, and Technology-integrated Instruction is employed up to a very great extent in the Family and Consumer Science classes as reflected in their overall mean scores of 3.64, 3.58, 3.59, 3.60, and 3.48, respectively. This finding suggests that respondents generally perceive teaching strategies to be present to a very great extent level within the research context.

2. Level of practical skills performance of Grade 11 and Grade 12 students in terms of Technical Competence; Procedural Accuracy and Quality of Work; Productivity and efficiency; and Safety Practices and Work Discipline. The analysis indicates that the level of practical skills performance of Grade 11 and 12 students in terms of Technical Competence; Procedural Accuracy and Quality of Work; Productivity and efficiency; and Safety Practices and Work Discipline is up "to a very great extent", as reflected in their overall mean scores of 3.49, 3.55, 3.48, and 3.67, respectively. This finding suggests that respondents generally perceive teaching strategies to be present at a very great extent level within the research context.

3. Level of workforce readiness of Grade 11 and Grade 12 students in terms of Communication Skills; Problem-Solving Skills; Teamwork and Collaboration; Adaptability; and Work values and Professionalism. The analysis indicates that the level of workforce readiness of Grade 11 and 12 students in terms of Communication Skills; Problem-Solving Skills; Teamwork and Collaboration; Adaptability; and Work values and Professionalism is up "to a very great extent", as reflected in their overall mean scores of 3.43, 3.49, 3.61, 3.50, and 3.62, respectively.

4. Significant relationship between teaching strategies and practical skills performance of Grade 11 and 12 students. The correlation analysis indicated a significant moderate relationship between teaching strategies and three specific performance domains: Technical Competence, Procedural Accuracy and Quality of Work, and Productivity and Efficiency (all $p < .001$). Consequently, the null hypotheses (H_0) for these intersections were

consistently rejected. Experiential Learning Activities demonstrated a moderate overall correlation with student performance, yielding its highest relationship with Technical Competence ($r = .74$, $p < .001$), followed closely by identical strong bonds with both Procedural Accuracy ($r = .73$, $p < .001$) and Productivity ($r = .73$, $p < .001$). Collaborative Learning also showed a particularly strong relationship with Technical Competence ($r = .71$, $p < .001$). Conversely, none of the teaching strategies demonstrated a statistically significant relationship with Safety Practices and Work Discipline. The null hypotheses for this domain failed to be rejected across all strategies, as all p-values exceeded the standard alpha level of .05 (ranging from $p = .079$ for Demonstration Strategy to $p = .430$ for Technology-Integrated Instruction). This suggests that students who reported greater exposure to experiential activities also tended to report higher technical competence. This finding is consistent with experiential learning theory because practical engagement provides learners with opportunities to apply and refine skills. However, because the study employed a non-experimental design and relied on self-reported measures, the finding should be interpreted as an association rather than evidence of causation.

5. Significant relationship between teaching strategies and workforce readiness of Grade 11 and 12 students. The correlation analysis revealed a significant positive relationship between demonstration strategy, collaborative learning, experiential learning activities, and differentiated instruction and in some of the dimensions of workforce readiness, such as communication skills, problem-solving skills, teamwork and collaboration, adaptability, and work values and professionalism.

6. Predictive Influence of teaching strategies on practical skills performance of Grade 11 and 12 students. The regression analysis demonstrated that teaching strategies across five dimensions – demonstration strategy, collaborative learning, experiential learning activities, differentiated instruction, and technology-integrated instruction significantly predict technical competence, procedural accuracy and quality of work, and productivity and efficiency, indicating that the teaching strategies play an important role in influencing

the practical skills performance. However, teaching strategies across all dimensions do not significantly predict practical skills performance in terms of safety practice and work discipline.

7. Predictive Influence of teaching strategies on the workforce readiness of Grade 11 and 12 students. The regression analysis conducted in the study revealed that teaching strategies across five dimensions – demonstration strategy, collaborative learning, experiential learning activities, differentiated instruction, and technology-integrated instruction significantly predict workforce readiness in terms of communication skills and problem-solving skills but not in terms of teamwork and collaboration, adaptability, and work values and professionalism of Grade 11 and 12 students.

8. Significant difference between the assessments of Grade 11 and Grade 12 students regarding Teaching strategies, Practical skills performance, and Workforce readiness. The inferential analysis revealed that there was no statistically significant difference in the assessments on teaching strategies, Practical skills performance, and Workforce readiness when senior high students were grouped according to grade level.

CONCLUSIONS

Based on the findings of the study, the following conclusions were drawn:

1. Level of teaching strategies employed in Family and Consumer Science classes as perceived by Grade 11 and 12 students. The results indicate that the teaching strategies employed is manifested to a very great extent level among the senior high students, suggesting that this factor is meaningfully present within the institutional or organizational context examined in the study.

2. Level of practical skills. The analysis indicates that the level of practical skills performance in terms of Technical Competence; Procedural Accuracy and Quality of Work; Productivity

and efficiency; and Safety Practices and Work Discipline is manifested at a very great extent level among the senior high students, suggesting that this factor is meaningfully present within the institutional or organizational context examined in the study.

3. Level of workforce readiness. The results indicate that the level of workforce readiness of Grade 11 and 12 students in terms of Communication Skills; Problem-Solving Skills; Teamwork and Collaboration; Adaptability; and Work values and Professionalism is manifested at a very great extent level among the senior high students, suggesting that this factor is meaningfully present within the institutional or organizational context examined in the study.

4. Significant relationship between teaching strategies and practical skills performance. There exists a significant moderate to strong relationship between teaching strategies across all dimensions and practical skills performance in terms of technical competence, procedural accuracy and quality of work, productivity and efficiency but a weak and no significant relationship in terms of safety practices and work discipline, indicating that changes in one variable are associated with corresponding changes in the other.

5. Significant relationship between teaching strategies and workforce readiness. There is a significant positive relationship between demonstration strategy, collaborative learning, experiential learning activities, and differentiated instruction and in some of the dimensions of workforce readiness such as communication skills, problem-solving skills, teamwork and collaboration, adaptability, and work values and professionalism.

6. Predictive Influence of teaching strategies on practical skills performance. The findings demonstrate that teaching strategies across five dimensions – demonstration strategy, collaborative learning, experiential learning activities, differentiated instruction and technology-integrated instruction significantly predicts technical competence, procedural accuracy and quality of work, and productivity and efficiency, suggesting that this factor plays an important role in influencing the outcome examined in the study.

7. Predictive Influence of teaching strategies on workforce readiness. The findings demonstrate that teaching strategies across five dimensions – demonstration strategy, collaborative learning, experiential learning activities, differentiated instruction and technology-integrated instruction significantly predict workforce readiness in terms of communication skills and problem solving skills. However, teaching strategies do not significantly predict workforce readiness in terms of teamwork and collaboration, adaptability, and work values and professionalism.

8. Significant difference between the assessments of Grade 11 and Grade 12 students regarding Teaching strategies, Practical skills performance, and Workforce readiness. The analysis suggests that Teaching strategies, Practical skills performance, and Workforce readiness do not vary significantly across groups when respondents are categorized according to their grade level, indicating the possible influence of contextual or demographic factors.

RECOMMENDATIONS

Based on the findings and limitations of the study, the following recommendations are proposed for future research:

1. Future studies may replicate this research in different institutional or geographic contexts to determine whether similar patterns and relationships among teaching strategies, practical skills performance, and workforce readiness can be observed across diverse settings.

2. Researchers may consider examining additional variables that may influence practical skills performance and workforce readiness, such as the family's economic status, IQ, or EQ level, and the resources of the school to provide a more comprehensive understanding of the phenomenon under investigation.

3. Future research may use longitudinal and mixed-method inquiries to follow a cohort of

students directly from their first day of Grade 11 through their final immersion semester. Combining quantitative tracking with qualitative reflective journals will clarify how and when students' professional values are permanently codified.

4. Subsequent studies may also explore the perspectives of other stakeholders, such as administrators, policymakers, or community members, to provide a more holistic understanding of the issue examined in the research.

5. Future researchers may investigate the long-term impact of interventions or strategies related to practical skills and workforce readiness to determine their sustainability and effectiveness over time.

These recommendations aim to encourage further scholarly inquiry that may expand the understanding of educational strategies as predictors to the skill performance and workforce readiness of students and contribute to the continued development of knowledge within the field.

Recommendations for Policy, Practice, or Curriculum Integration

Based on the findings and conclusions of the study, the following recommendations are proposed to support improvements in policy, professional practice, and curriculum implementation:

1. To differentiate Grade 11 from Grade 12, educational institutions and organizational leaders should mandate a structural separation between the grade levels' laboratory expectations. While Grade 11 should focus on foundational standardization, Grade 12 laboratory spaces should be heavily restructured to mimic hyper-realistic corporate environments with increase operational velocity.

2. Educational institutions and organizational leaders may consider introducing short workshops or modules on managing group friction and giving constructive feedback to help students maintain interpersonal harmony under pressure.

3. Practitioners and administrators should provide the teachers with professional development focused specially on behavioral enforcement techniques, helping then transition from lecturing on safety rule to cultivating a strict, industry-grade organizational safety culture.

4. Curriculum developers and educational leaders should redesign standard laboratory exercises to pivot away from prescriptive checklist tracking. Instead, courses should implement unguided, outcome-driven scenarios where students are presented with an outcome specification. Furthermore, turn the first 10 minutes of every session into a formal, student-led workplace safety briefing. Students must rotate responsibilities to deliver hazard assessments for that day's tasks, converting demonstrations from passive observation into active accountability.

5. Institutions may implement "5S" (Sort. Set in order, Shine, Standardize, Sustain) workplace drills during laboratory hours to directly address and uplift workspace organizational habits.

6. To target adaptability and work values, policymakers and institutional leaders are encouraged to revise curriculum guides to integrate mandatory, step-by-step teacher demonstration protocols for technical and communicative competencies.

7. To burst the current performance plateau, wherein Grades 11 and 12 have no significant difference in practical skills performance, curriculum designers should embed specific industry-recognized certifications or technical micro-credentials exclusively into the Grade 12 course sequences, explicitly raising the bar for procedural accuracy and productivity.

These recommendations aim to ensure that the insights generated by the study contribute not only to academic knowledge but also to practical improvements in policy formulation, professional practice, and curriculum development within the field.

REFERENCES

Abapo, J. M. C. (2024). Project C-TIP: Gearing up TLE and TVL teachers towards the improvement of learners' industrial skills. Department of Education Research Portal.

Agpaoa, M., & Diaz, R. C. (2025). Technology and livelihood education instruction in the public secondary schools: An assessment. Journal of Vocational and Technical Pedagogy, 12(2), 45–58.

Accellier Education. (2024). The parameters of vocational instruction

modeling and productivity optimization. Vocational Training Insights.

Alvarez, J.M., & Corpuz, R. T. (2025). Speaking competence of senior high school graduates towards the development and evaluation of job readiness training program for BPO industry. International Journal of Research and Innovation in Social Science, 9(4), 1432-1445. rsisinternational.org

Anderson, T., & Rivera, M. (2022). Teaching strategies and student engagement in technical and vocational education. Journal of Vocational Education Research, 47(2), 145–162. https://doi.org/10.1080/13636820.2022.2034567

Asian Development Bank. (2021). Education and skills for inclusive growth in Asia and the Pacific. https://doi.org/10.22617/TCS210001

Australian Bureau of Statistics. (2023, February 2). Census and sample. https://www.abs.gov.au/statistics/understanding-statistics/statistical-terms-and-concepts/census-and-sample

Bandura, A. (2023). Social foundations of thought and action: A social cognitive theory. Prentice Hall.

Bandura, A. (1977). Social learning theory. Prentice Hall. Social Learning

Bascuguin, C. B., & Generoso, E. T. (2026). Pedagogical flexibility and adaptive teaching strategies for practical skills mastery in computer systems servicing: A mixed-methods brief report from Batangas, Philippines. Frontiers in Education, 11, Article 1813666. https://doi.org/10.3389/feduc.2026.1813666

Bautista, N. R. (2023). Demonstration-based instruction and practical skills performance among senior high school learners [Unpublished undergraduate thesis]. University of the Philippines

Billett, S. (2021). Vocational education and the development of occupational capacities. Journal of Vocational Education & Training, 73(3), 365–380. https://doi.org/10.1080/13636820.2020.1850543

Claessens, B. J. C., van Eerde, W., Rutte, C. G., & Roe, R. A. (2020). A review of time management literature. Personnel Review, 49(2), 234–256. https://doi.org/10.1108/PR-12-2018-0501

Collano, R. P. (2024). Relationship of teaching strategies of Technology and Livelihood Education (TLE) teachers in the new normal and learning performance of the senior high school students in selected high schools in the Division of Valenzuela. Psychology and Education: A Multidisciplinary Journal, 25(7), 959–979. https://doi.org/10.5281/zenodo.13834093

Condliffe, B., Quint, J., Visher, M. G., Bangser, M. R., Drohojowska, S., & Saco, L. (2021). Project-based learning: A literature review. MDRC.

Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications.

Cruz, M. A., Santos, J. D., & Lim, R. P. (2022). Pedagogical limitations of observational learning in industrial arts education. Journal of Vocational Education Studies, 15(2), 112-128

Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice. Applied Developmental Science, 24(2), 97–140. https://doi.org/10.1080/10888691.2018.1537791

De Guzman, A. L., & Torres, B. M. (2024). Project-based learning and performance outcomes in senior high school technical-vocational education [Unpublished master's thesis]. Philippine Normal University.

Dela Cruz, J. M., Garcia, P. R., & Mendoza, S. L. (2024). Workplace readiness competencies among technical-vocational senior high school graduates [Unpublished master's thesis]. De La Salle University, Manila.

Department of Education. (2022). K to 12 curriculum guide for technology and livelihood education. https://www.deped.gov.ph

Department of Education. (2021, July 12). DepEd, JICA conduct follow-up survey on SHS graduates. https://www.deped.gov.ph/2021/07/12/deped-jica-conduct-follow-up-survey-on-shs-graduates/

Dewey, J. (1986). Experience and Education. The Educational Forum, 50(3),241–252.https://doi.org/10.1080/00131728609335764

Dreyfus, H.L. & Dreyfus, S.E. (1986). Mind over machine: The power of human intuition and experience in the era of the computer. Free Press.

Dizon, R. T., Santos, E. M., & Lim, J. P. (2024). Teaching methods and practical performance in food preparation and household management activities [Unpublished undergraduate thesis]. De La Salle University, Manila.

Fernandez, K. A. (2023). Communication, adaptability, and professionalism as indicators of workforce readiness among students [Unpublished undergraduate thesis]. Philippine Normal University, Manila.

Fullan, M. (2021). The right drivers for whole system success. Centre for Strategic Education.

Garcia, R. T., & Dela Cruz, M. (2023). Skills-based education in Philippine senior high schools. Asia Pacific Education Review, 24(2), 211–225.

Gardner, H. (2011). Frames of mind: The theory of multiple intelligences (3rd ed.). Basic Books.

Geller, E. S. (2001). The psychology of safety handbook. CRC Press.

Hattie, J. (2023). Visible learning: The sequel. Routledge. https://doi.org/10.4324/9781003380219

Heckman, J. J., & Kautz, T. (2021). Fostering and measuring skills. Journal of Economic Perspectives, 35(1), 3–24.

Hidalgo, J.A.M., Fabro, R.B.B., Castro, M.S., Dela Cruz, K.L., Perez, K.M.P., Quiaoit, J.M.P., & Juan, S.M.G. (2025). Teaching Strategies and their Effects on Competency Assessment Performance of Senior High School Students. IJRISS. Volume IX Issue VIII.

DOI: https://dx.doi.org/10.47772/IJRISS.2025.908000355

Impact of Learning Tools on Students' Technical Skills Development. (2025).International Interdisciplinary Research Journal, 9(1), 45-58. iiari.org

International Labour Organization, United Nations Educational, Scientific and Cultural Organization, & World Bank (2023). Building better formal TVET systems: Principles and practice in low- and middle-income countries. International Labour Organization. https://www.ilo.org/publications/building-better-formal-tvet-systems-principles-and-practice-low-and-middle

International Labour Organization. (2021). Global framework on core skills for life and work. https://www.ilo.org

International Vocational Training Council. (2024). The parameters of workplace safety enforcement and behavioral compliance frameworks within secondary educational laboratories. IVTC Publishing.

Jandari, S., Al-Zyoud, M., & Heiny, J. (2020). Safety behavior in the laboratory among university students: An application of the theory of planned behavior. Journal of Safety and Occupational Health Engineering, 14(3), 112-125. https://www.researchgate.net/publication/344403986

Johnson, D. W., & Johnson, R. T. (2022). Cooperative learning and achievement. Educational Psychology Review, 34(1), 1–20. https://doi.org/10.1007/s10648-021-09602-7

Jonassen, D. H. (2000). Toward a design theory of problem solving. Educational Technology Research and Development, 48(4), 63-85.

Kim, S., & Park, J. (2022). Effects of differentiated instruction. Teaching and Teacher Education, 112, 103631. https://doi.org/10.1016/j.tate.2022.103631

Kolb, D.A. (2015). Experiential learning: Experience as the source of learning and development (2nd ed.). Pearson Education.

Kolb, D. A. (1984). Experiential learning: Experience as the source of learning and development. Prentice-Hall.

Lave, J., & Wenger, E. (1991). Situated learning: Legitimate peripheral participation. Cambridge University Press.

Leithwood, K., Harris, A., & Hopkins, D. (2021). Seven strong claims about successful school leadership revisited. School Leadership & Management, 41(1–2), 5–22. https://doi.org/10.1080/13632434.2019.1596077

Lopez, G. V. (2022). Instructional practices and student achievement in practical and technical education [Unpublished undergraduate thesis]. Philippine Christian University.

Lucas, B., Sepencer, E., & Claxton, G. (2012). How to teach vocational education: A theory of vocational pedagogy. City & Guilds Cenre for Skills Development.

Mabini, L. V. (2026). The limits of the screen: Assessing the impact of technology-integrated instruction on the behavioral and affective readiness of vocational students. Samar Division Graduate Repository.

Macan, T. H. (1994). Time management: Test of a process model. Journal of Applied Psychology, 79(3), 381–391. https://doi.org/10.1037/0021-9010.79.3.381

MacDonald, A. L. (2020). Of science and statistics: The scientific basis of the census. Statistical Journal of the IAOS, 36(1), 17–34. https://doi.org/10.3233/SJI-190596

Magallanes, R.J. (2025). Assessing the level of laboratory safety awareness among science education students. Journal of interdisciplinary Perspectives, 3(4), 45-58.

https://jppublication.com/index.php/jp/article/view/1913

Marope, P. T. M., Chakroun, B., & Holmes, K. (2021). Unleashing the potential: Transforming TVET. UNESCO.

Mendoza, C. D. (2022). Differentiated instruction and student engagement in practical learning environments [Unpublished master's thesis]. Philippine Normal University.

Mercado, R. B., & Salonga, T. C. (2021). Employability skills development through school-based practical learning [Unpublished master's thesis]. Technological University of the Philippines.

Mishra, P., & Koehler, M. J. (2020). Technological pedagogical content knowledge: A framework for teacher knowledge. Teachers College Record, 108(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.

Mukhopadhyay, M. (2020). Total quality management in education (3rd ed.). SAGE

Publications

National Association of Colleges and Employers. (2022). Job outlook 2022. https://www.naceweb.org

Navarro, P. S., & Perez, L. A. (2021). Procedural accuracy, task completion, and performance assessment in skills-based education [Unpublished master's thesis]. Philippine Normal University

Oliveri, M. E., Lawless, R., & Molloy, H. (2017). A literature review on collaborative problem solving for college and workforce readiness. ETS Research Report Series, 2017(1), 1–27. https://doi.org/10.1002/ets2.12133

Organisation for Economic Co-operation and Development. (2020). What students learn matters: Towards a 21st century curriculum. OECD Publishing. https://doi.org/10.1787/d86d4d9a-en

Organisation for Economic Co-operation and Development. (2021). Skills outlook 2021. https://doi.org/10.1787/0ae365b4-en

Organisation for Economic Co-operation and Development. (2023). Future-ready education systems. https://doi.org/10.1787/9789264300000-en

Piaget, J. (1970). Science of education and the psychology of the child (D. Puentedura, R. R. (2006). Transformation, technology, and education. Hippasus. Coltman, Trans.). Orion Press.

Pulakos, E. D., Arad, S., Donovan, M. A., & Plamondon, K. E. (2000). Adaptability in the workplace: Development of a taxonomy of adaptive performance. Journal of Applied Psychology, 85(4), 612–624. https://doi.org/10.1037/0021-9010.85.4.612

Ramos, J. P., Garcia, M. L., & Flores, A. R. (2023). Active learning strategies and practical competency acquisition among technical-vocational students [Unpublished

undergraduate thesis]. De La Salle University-Dasmarinas. Philippines

Ramos, E. D., & Diaz, F. M. (2023). Collaborative learning and problem-solving skills as predictors of perceived work readiness [Unpublished undergraduate thesis]. Southern Leyte State University, Faculty Research.

Ramos, A. P. (2023). Research designs and measurement practices in studies of practical skills and workforce readiness [Unpublished master's thesis]. University of Northern Philippines, Vigan City.

Republic of the Philippines. (2023). EDCOM II year one report. https://edcom2.gov.ph

Reyes, M. A., & Aquino, C. L. (2022). Performance-based assessment of technical competence and work procedures in senior high school [Unpublished master's thesis]. Pamantasan ng Lungsod ng Maynila.

Reyes, J. P., & Santos, K. L. (2024). Workforce readiness among senior high school graduates. Philippine Journal of Social Sciences, 9(1), 55–70.

Roble, D. M. L. (2023). Competency level, employers' expectations and work immersion performance of senior high school technical-vocational and livelihood (TVL) students. Asian Journal on Perspectives in Education, 2(1), 43–63. https://doi.org/10.63529/ajpe.v2i1.7657

Robinson, V. M. J. (2021). Reduce change to increase improvement.

Salas, E., Reyes, D. L., & McDaniel, S. H. (2022). Teamwork in education and workplace settings. Human Resource Development Review, 21(4), 405–430.

Santos, J. M., & Del Rosario, A. L. (2024). Relationship of teaching strategies of technology and livelihood education (TLE) teachers and learning performance of the senior high school students. Division of Valenzuela E-Journals.

Santos, J.M., & Del Rosario, Z.J.P. (2024). Program for International Student Assessment: A guide for School Administrators Leading to Higher Academic Achievements. International Journal of Multidisciplinary Educational Research and Innovation (IJMERI), Volume 2, Issue 2, in May 2024

Santos, E. B., & Reyes, F. C. (2023). Instructional modeling and cognitive efficiency in senior high school TVET tracks. Philippine Journal of Technical-Vocational Education, 8(1), 46-60.

Santos, M. L., & Reyes, A. P. (2022). Teaching strategies and student performance. Philippine Journal of Education, 101(1), 45–60.

Santos, R. M., & Reyes, L. P. (2021). Teaching strategies and competency development among senior high school learners in family and consumer sciences. Philippine Journal of Technical and Livelihood Education, 8(2), 45–58.

Sari, P.N., & Setiawan, H. (2025). Communication skills and work readiness of senior high school technical-vocational-livelihood track students. Journal of interdisciplinary Perspectives, 3(2), 201-214. jippublication.com

Savickas, M. L. (2013). Career construction theory and practice. In S. D. Brown & R. W. Lent (Eds.), Career development and counseling: Putting theory and research to work (2nd ed., pp. 147–183). John Wiley & Sons.

Schleicher, A. (2022). World class: How to build a 21st-century school system. OECD Publishing.

Situmorang, M. (2024). Effectiveness of Professional Teacher Education in Developing Educational Technology Skills in the Digital Era. Journal of Vocational and Digital Education, 12(3), 201-215. researchgate.net

Skinner, B. F. (1953). Science and human behavior. Macmillan.

Squires, D. A. (2008). Curriculum alignment: Research-based strategies for increasing student achievement. Corwin Press.

Super, D. E. (1980). A life-span, life-space approach to career development.

Journal of Vocational Behavior, 16(3), 282–298. https://doi.org/10.1016/0001-8791(80)90056-1

Tomlinson, C. A. (2021). How to differentiate instruction in academically diverse classrooms (3rd ed.). ASCD.

Torres, A. and Lim, M. (2022) Practical skills development in TLE programs. International Journal of Educational Development, 89, 102545.

Trilling, B., & Fadel, C. (2009). 21st century skills. Jossey-Bass.

UNESCO. (2022). Transforming technical and vocational education and training for successful and just transitions. https://unesdoc.unesco.org

United Nations. (2021). Sustainable development goals report. https://unstats.un.org

Villanueva, M., & Cruz, E. (2022). Instructional approaches and learning outcomes in family and consumer science education [Unpublished master's thesis]. University of Batangas. Philippines.

Villanueva, D. L., & Ramos, E. (2023). Teaching effectiveness in vocational education. Journal of Technical Education and Training, 15(2), 33–48.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.

World Bank. (2022). Skills development in the Philippines. https://doi.org/10.1596/978-1-4648-1765-8

World Economic Forum. (2023). Future of jobs report 2023. https://www.weforum.org

Zakaria, N., Ahmad, A., & Ismail, Z. (2023). Assessment of knowledge, attitudes and practices of laboratory personnel towards chemical safety in academic sectors. Journal of Sustainability Science and Management, 17(12), 105-119. https://www.researchgate.net/publication/363455244

Zhang, L., & Liu, Q. (2021). Instructional strategies and learning outcomes. Educational Research Review, 34, 100412. https://doi.org/10.1016/j.edurev.2021.100412

Zimmerman, B.J. (2000). Attaining self-regulation: A social cognitive commentary. In M. Boekaerts, P.R. Pintrich, & M. Zeidner (Eds.), Handbook of self-regulation (pp. 13-39). Academic Press. Doi.org