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FACTORS INFLUENCING THE ACQUISITION OF TECHNICAL SKILLS AMONG GRADE 9 STUDENTS OF PRES. MANUEL A. ROXAS NATIONAL HIGH SCHOOL

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ABSTRACT

This study aimed to determine the factors influencing the acquisition of technical skills among Grade 9 students of Pres. Manuel A. Roxas National High School situated at Manuel A. Roxas, Zamboanga del Norte, this school year 2025-2026. It was found out that the development of technical skills among Grade 9 students is largely influenced by teacher-related factors, particularly the availability of guidance and constructive feedback. This suggests that effective teaching practices play a central role in helping learners refine their abilities and gain confidence in performing technical tasks. The findings also highlight the importance of students' self-efficacy and parental support, as both contribute significantly to motivation, persistence, and skill improvement. Moreover, access to digital technologies enhances students' learning experiences by providing opportunities for simulation-based practice and innovation. The alignment of the K–12 curriculum with industry standards ensures that the skills learned in school are relevant and applicable to real-world employment. Lastly, the absence of significant differences across demographic profiles implies that factors influencing technical skills affect all students similarly, regardless of sex, age, or specialization. Thus, it is underscored the need for continuous teacher development, curriculum enhancement, and the integration of digital tools and parental engagement to strengthen technical-vocational education.

Keywords: *Technical Skills, Teacher-Related Factor, Student-Related Factor, Resource-Facility Factor, Socio-Economic and Family Factor, Curriculum and Policy Factor*

INTRODUCTION

In the rapidly evolving landscape of the 21st century, education is increasingly shifting toward equipping learners with technical skills that foster employability, innovation, and adaptability. Technical skills—defined as the ability to perform specialized tasks using practical knowledge and competencies—are integral to preparing students for both higher education and the world of work (Singh & Singh 2020). In the Philippines, the K-12 curriculum introduced by the Department of Education (DepEd) emphasizes the development of such skills, particularly through technical-vocational education and training (TVET). At the junior high school level, particularly in Grade 9, students are exposed to specialized subjects where technical skills become a focal point of learning. This stage is significant because it lays the groundwork for their chosen track in senior high school, while also ensuring that students are career-ready and globally competitive (DepEd 2016).

At Pres. Manuel A. Roxas National High School, the acquisition of technical skills among Grade 9 students is influenced by a variety of factors such as the availability of learning resources, teaching strategies, socio-economic background, peer influence, and learner motivation. Research has shown that the learning environment and instructional methods significantly impact students' ability to acquire technical knowledge and skills (Olaniyan & Okemakinde 2020). Additionally, students' socio-economic conditions and family support play crucial roles in determining how effectively they engage in skill-based learning activities (Ogunlade, 2020). Investigating these factors within the school's context is therefore necessary to understand the challenges and opportunities that affect the technical education of Grade 9 learners.

The rationale for this study lies in the recognition that technical skills are indispensable for students in bridging the gap between classroom learning and real-world application. Technical education has been identified as a driver of economic growth and individual employability, particularly in developing countries like the Philippines, where education is seen as a pathway to poverty alleviation (Asian Development Bank 2020). Despite government efforts to strengthen TVET through the K-12 program, challenges remain, including inadequate facilities, lack of instructional materials, and varying levels of teacher competence (Ballesteros, 2020). Moreover, external factors such as family income, community support, and access to technology continue to influence how effectively learners can develop technical competencies.

By examining the factors influencing Grade 9 students' acquisition of technical skills at Pres. Manuel A. Roxas National High School, this study aims to contribute to a deeper understanding of how contextual, personal, and institutional factors shape student outcomes. The findings can serve as a basis for designing targeted interventions, improving teaching strategies, and optimizing resource allocation. Ultimately, this research supports the broader goal of equipping Filipino students with technical competencies aligned with both national development priorities and the demands of the global workforce. Thus, the researcher aimed determine the factors influencing the acquisition of technical skills among Grade 9 students of Pres. Manuel A. Roxas National

High School situated at Manuel A. Roxas, Zamboanga del Norte, this school year 2025-2026.

Research Questions

This study aimed to determine the factors influencing the acquisition of technical skills among Grade 9 students of Pres. Manual Roxas National High School situated at Manuel Roxas, Zamboanga del Norte, this school year 2025-2026.

Specifically, it sought to answer the following questions:

1. What is the profile of the respondents in terms of:
    1.1. Sex;
    1.2. Age; and
    1.3. Specializations?
2. What are the factors that affect the acquisition of technical skills among the respondents in terms of:
    2.1 teacher-related factors;
    2.2. student-related factors;
    2.3. resource-facility factors;
    2.4. socio-economic and family factors; and
    2.5. curriculum and policy factors?
3. Is there a significant difference on the factors that affect the acquisition of technical skills among respondents when analyzed according to profile?

METHODOLOGY

The study utilized survey research methodologies to gather data on the acquisition of technical skills via a questionnaire checklist, as delineated by Creswell and Guetterman (2019). It was conducted at President Manuel A. Roxas National High School located in Langatian, Roxas, Zamboanga del Norte, with a total of 166 respondents sampled from a population of 285 Grade 9 pupils. A self-made questionnaire was utilized as the primary research instrument, comprising two parts: one focusing on the respondents' profiles and the other on factors influencing the acquisition of technical skills.

The instrument's validity was established through face validity, construct validity, and content validity assessments, while reliability was tested and confirmed with a Cronbach Alpha value of 0.832, indicating satisfactory reliability. Ethical considerations were strictly adhered to; the researcher ensured no harm occurred to respondents, obtained approval from the school principal, maintained respondent anonymity, and destroyed data collection tools post-study to uphold confidentiality.

Data collection involved distributing the validated instruments personally to respondents after receiving permission, followed by data tabulation. The gathered data were subjected to statistical analysis, using frequency count, percentage computation,

weighted mean, Kruskal-Wallis H-test, and Wilcoxon Rank-Sum U-test for statistical treatment.

RESULTS AND DISCUSSION

This section presents the responses of the one hundred sixty-six (166) Grade 9 students of President Manual A. Roxas National High School. The responses were treated statistically in order to answer the statement of the problem of the present investigation.

Table 1 presents the profile of the respondents in terms of sex. The table revealed that the majority of respondents were male, with 88 out of 166 respondents, or 53.01%, compared to 78 female respondents, or 46.99%, indicating that Grade 9 students were predominantly male. In support, Garcia and Villanueva (2020) point to the fact that gender disparity in educational settings often arises from community norms, family expectations, and perceived academic interests of male and female learners.

Table 1. Profile of the Respondents in terms of Sex

Respondents' Sex	*Frequency*	*Percentage*
Male	88	53.01
Female	78	46.99
Total	***166***	***100.00***

Table 2 shows the profile of the respondents in terms of age. The table revealed that most of the respondents were below 15 years old, comprising 130 out of 166 respondents, or 78.31%, followed by those respondents who were within the age bracket of 15–16 years old, comprising 28 out of 166 respondents, or 16.87%, as compared to those respondents who were above 16 years old, comprising 8 out of 166 respondents, or 4.82%. The table revealed that most of the respondents were below 15 years old, which implies that most of the Grade 9 students were in their adolescent stage. In support, the World Health Organization (2023) pointed out that adolescence is the stage between 10 and 19 years of age, during which individuals experience significant growth and development in preparation for adulthood. Also, at the Grade 9 level, students are generally in the period of adolescence, marked by rapid physical, emotional, and cognitive changes.

Table 2. Profile of the Respondents in terms of Age

Respondents' Age	*Frequency*	*Percentage*
Below 15 years old	130	78.31
15 – 16 years old	28	16.87
Above 16 years old	8	4.82
Total	***166***	***100.00***

Table 3 displays the profile of the respondents in terms of specialization. The table pointed out that most of the respondents were enrolled in industrial arts specialization, comprising 66 out of 166 respondents, or 39.76%, followed by those respondents who enrolled in information and communication technology specialization, comprising 50 out of 166 respondents, or 30.12%, as compared to those respondents who enrolled in agri-fishery arts specialization, comprising 3 out of 166 respondents, or 1.81%. The table revealed that most of the respondents enrolled in industrial arts specialization, which implies that most of the Grade 9 students were enrolled in industrial arts specialization. In support, Rola and Mateo (2020) stress the fact that enrollment in industrial arts among Grade 9 students may also reflect local economic conditions and employment opportunities. Further, students from rural and developing communities often prefer technical-vocational specializations such as industrial arts due to their practical applicability and potential for immediate livelihood benefits.

Table 3. Profile of the Respondents in terms of Specialization

Respondents' Specialization	***Frequency***	***Percentage***
Home Economic Specialization	47	28.31
Industrial Arts Specialization	66	39.76
Agri-Fishery Arts Specialization	3	1.81
Information and Communication Technology Specialization	50	30.12
Total	***166***	***100.00***

Table 4. Factors Affecting Technical Skills as to Teacher-Related Factors

Statements	***Factors Affecting the Technical Skills as to Teacher-Related Factors***	
	AWV	***Description***
1. The teacher's competence and expertise in technical subjects directly affect students' ability to grasp and apply practical skills, as knowledgeable teachers serve as effective models for hands-on learning.	4.02	Agree
2. The instructional strategies and methodologies employed by teachers—such as demonstrations, project-based learning, and interactive workshops—enhance students' engagement and mastery of technical skills.	3.88	Agree
3. The availability of teacher guidance and feedback helps learners correct mistakes, refine techniques, and build confidence in performing technical tasks.	4.29	Strongly Agree

4. A teacher's motivation, enthusiasm, and professional attitude influence the classroom environment, which in turn fosters students' interest and willingness to learn technical skills.	4.08	Agree
5. Continuous teacher training and professional development ensure that educators remain updated with industry-relevant practices, thereby equipping students with skills aligned to labor market demands.	3.95	Agree
Mean	***4.04***	***Agree***

Legend: 1.00 – 1.80 = Strongly Disagree; 1.81 – 2.60 = Disagree; 2.61 – 3.40 = Neither Disagree nor Agree; 3.40 – 4.21 = Agree; 4.21 – 5.00 = Strongly Agree

Table 4 displays the teacher-related factors that affect technical skills. The table revealed that most of the respondents strongly agree that the availability of teacher guidance and feedback helps learners correct mistakes, refine techniques, and build confidence in performing technical tasks having an average weighted value of 4.29 followed by agree on a teacher's motivation, enthusiasm, and professional attitude influence the classroom environment, which in turn fosters students' interest and willingness to learn technical skills having an average weighted mean of 4.08 as compared to agree on the instructional strategies and methodologies employed by teachers—such as demonstrations, project-based learning, and interactive workshops—enhance students' engagement and mastery of technical skills having an average weighted value of 3.88. The mean on this aspect is 4.04, verbally interpreted as "Agree." The findings stressed that most of the respondents strongly agree that the availability of teacher guidance and feedback helps learners correct mistakes, refine techniques, and build confidence in performing technical tasks, which implies that teacher-related factors that affect technical skills connote the availability of teacher guidance and feedback, which helps learners correct mistakes, refine techniques, and build confidence in performing technical tasks. In support, Gess-Newsome et al. (2020) point out the fact that teacher-related factors are vital in developing students' technical skills, particularly in skill-based learning domains like industrial arts. Teacher guidance and timely feedback enable learners to correct mistakes and build confidence. Further, it asserts that effective feedback significantly impacts student achievement by bridging performance gaps. Furthermore, it emphasizes that teacher expertise and support enhance mastery of procedural skills. Thus, competent instruction in Technology and Livelihood Education ensures the development of practical competencies and confidence in hands-on tasks. Ultimately, skilled teachers are essential for shaping learners' technical proficiency and performance.

Table 5. Factors Affecting Technical Skills as to Student-Related Factors

Statements	*Factors Affecting the Technical Skills as to Student-Related Factors*	
	AWV	***Description***
1. A student's motivation and interest in technical-vocational subjects significantly determine their level of engagement and persistence in learning practical skills.	3.92	Agree
2. Self-efficacy and confidence influence how well learners perform technical tasks, since students who believe in their abilities are more likely to practice and improve their competencies.	4.05	Agree
3. Attitudes and perceptions toward technical education—whether they view it as valuable for future careers or as a minor subject—affect the seriousness and effort they invest in skill development.	4.00	Agree
4. Learning styles and study habits, such as hands-on practice, regular review, and discipline, contribute to the mastery and retention of technical skills.	3.94	Agree
5. Peer influence and collaboration play a role, as positive group work, teamwork, and encouragement from classmates can enhance skill acquisition, while negative peer pressure may hinder it.	3.83	Agree
Mean	***3.95***	***Agree***

Legend: 1.00 – 1.80 = Strongly Disagree; 1.81 – 2.60 = Disagree; 2.61 – 3.40 = Neither Disagree nor Agree; 3.40 – 4.21 = Agree; 4.21 – 5.00 = Strongly Agree

Table 5 displays the student-related factors that affect technical skills. The table pointed out that most of the respondents agree that self-efficacy and confidence influence how well learners perform technical tasks, since students who believe in their abilities are more likely to practice and improve their competencies. Having an average weighted value of 4.05, followed by agreeing on attitudes and perceptions toward technical education—whether they view it as valuable for future careers or as a minor subject—affect the seriousness and effort they invest in skill development, having an average weighted value of 4.00, as compared to agreeing that peer influence and collaboration play a role, as positive group work, teamwork, and encouragement from classmates can enhance skill acquisition, while negative peer pressure may hinder it, having an average weighted value of 3.83. The findings stressed that most of the respondents agree that self-efficacy and confidence influence how well learners perform technical tasks, since students who believe in their abilities are more likely to practice and improve their competencies. which implies that student-related factors that affect technical skills,

connoting self-efficacy and confidence, influence how well learners perform technical tasks, since students who believe in their abilities are more likely to practice and improve their competencies. In support, Schunk & DiBenedetto (2020) emphasize the fact that student-related factors, particularly self-efficacy and confidence, are essential for the development of technical skills. Self-efficacy, defined as an individual's belief in their ability to succeed, influences motivation and persistence in technical-vocational education. Higher self-efficacy leads to more active engagement in self-regulated learning, improving skill mastery and performance. Confidence and positive self-perception further enhance persistence, accuracy, and problem-solving in practical tasks, promoting continuous improvement and lifelong learning.

Table 6. Factors Affecting Technical Skills as to Resource-Facility Factors

Statements	***Factors Affecting the Technical Skills as to Resource-Facility Factor***	
	AWV	***Description***
1. The availability and adequacy of tools, equipment, and materials in workshops and laboratories directly affect students' ability to practice and apply technical skills effectively.	3.75	Agree
2. Modern and updated facilities ensure that learners are trained using technologies and methods aligned with current industry standards.	3.81	Agree
3. The maintenance and functionality of school resources impact the safety and quality of hands-on learning experiences in technical-vocational subjects.	3.88	Agree
4. Access to digital technologies and ICT resources enhances students' opportunities for simulation-based learning and innovation in technical training.	4.02	Agree
5. The overall condition of classrooms and laboratories, including space, ventilation, and layout, influences the conduciveness of the learning environment for technical skill acquisition.	3.94	Agree
Mean	***3.88***	***Agree***

Legend: 1.00 – 1.80 = Strongly Disagree; 1.81 – 2.60 = Disagree; 2.61 – 3.40 = Neither Disagree nor Agree; 3.40 – 4.21 = Agree; 4.21 – 5.00 = Strongly Agree

Table 6 shows the factors affecting technical skills as to resource- facility factor. The table revealed that most of the respondents agree on access to digital technologies and ICT resources enhances students' opportunities for simulation-based learning and innovation in technical training having an average weighted value of 4.02 followed by agree that the overall condition of classrooms and laboratories, including space,

ventilation, and layout, influences the conduciveness of the learning environment for technical skill acquisition having an average weighted value of 3.94 as compared to agree on the availability and adequacy of tools, equipment, and materials in workshops and laboratories directly affect students' ability to practice and apply technical skills effectively having an average weighted value of 3.75. The mean on this aspect is 3.88 verbally interpreted as agree. The findings stressed that most of the respondents agree on access to digital technologies and ICT resources enhances students' opportunities for simulation-based learning and innovation in technical training which implies that resource-facility factor that affect technical skills connotes access to digital technologies and ICT resources enhances students' opportunities for simulation-based learning and innovation in technical training. In support, Tuah and Naing (2021) pointed out that resource and facility factors, especially the availability of digital technologies and ICT resources, significantly influence students' technical skill acquisition. Access to modern tools enhances simulation-based learning and innovation. The ICT integration in technical and vocational education promotes practical skill development in a safe environment, fostering creativity and problem-solving. Further, sufficient digital resources improve student engagement and performance in technical education, underscoring the importance of resource support for effective skills training.

Table 7. Factors Affecting Technical Skills as to Socio-Economic and Family Factors

Statements	***Factors Affecting the Technical Skills as to Socio-Economic and Family Factor***	
	AWV	***Description***
1. A family's income level determines the extent to which students can access necessary materials, tools, and technology for practicing and enhancing technical skills.	4.03	Agree
2. Parental support and encouragement significantly shape students' motivation and persistence in engaging with technical-vocational subjects.	4.06	Agree
3. The educational background of parents influences how they value technical education, which may affect their guidance and expectations for their children's skill development.	3.83	Agree
4. Household responsibilities and economic pressures sometimes limit the time and energy students can dedicate to practicing technical skills.	3.67	Agree
5. Peer and community influence within the family environment can encourage or	3.73	Agree

discourage students from pursuing technical skill development, depending on the social value placed on technical-vocational education.		
Mean	***3.86***	***Agree***

Legend: 1.00 – 1.80 = Strongly Disagree; 1.81 – 2.60 = Disagree; 2.61 – 3.40 = Neither Disagree nor Agree; 3.40 – 4.21 = Agree; 4.21 – 5.00 = Strongly Agree

Table 7 presents the socio-economic and family factors that influence technical skills. The table revealed that most of the respondents agree that parental support and encouragement significantly shape students' motivation and persistence in engaging with technical-vocational subjects, having an average weighted value of 4.06, followed by agree that a family's income level determines the extent to which students can access necessary materials, tools, and technology for practicing and enhancing technical skills, having an average weighted value of 4.03, as compared to agree that household responsibilities and economic pressures sometimes limit the time and energy students can dedicate to practicing technical skills, having an average weighted value of 3.67. The mean on this aspect is 3.86, verbally interpreted as "agree." The findings stressed that most of the respondents agree that parental support and encouragement significantly shape students' motivation and persistence in engaging with technical-vocational subjects, which implies that socio-economic and family factors affecting technical skills connote parental support and encouragement significantly shape students' motivation and persistence in engaging with technical-vocational subjects. In support, UNESCO (2021) avers the fact that socio-economic and family factors significantly influence the development of students' technical skills, with parental support being a crucial element. Parental interest and financial or emotional support correlate with increased student motivation and engagement in technical-vocational subjects. Further, a positive link between parental encouragement and students' self-efficacy and parental involvement enhances educational performance across various socioeconomic statuses. Also, family support is essential for maintaining participation in technical education, especially for low-income households facing financial limitations.

Table 8. Factors Affecting Technical Skills as to Curriculum and Policy Factors

Statements	***Factors Affecting the Technical Skills as to Curriculum and Policy Factor***	
	AWV	***Description***
1. The relevance and alignment of the K–12 curriculum to industry standards determine how applicable and useful the technical skills learned in school will be for future employment.	4.05	Agree
2. The design and content of TLE/TVL modules affect the depth of students' technical knowledge and their ability to perform practical tasks.	3.83	Agree

3. Assessment methods and evaluation policies—whether performance-based or theoretical—shape how students focus on practicing and mastering technical skills.	3.99	Agree
4. The availability of work immersion opportunities mandated by the curriculum provides students with real-world exposure that enhances their technical competencies.	3.88	Agree
5. Government policies and resource allocation to public schools directly impact the quality of technical-vocational education, particularly in terms of funding for equipment, training, and facilities.	4.02	Agree
Mean	***3.95***	***Agree***

Legend: 1.00 – 1.80 = Strongly Disagree; 1.81 – 2.60 = Disagree; 2.61 – 3.40 = Neither Disagree nor Agree; 3.40 – 4.21 = Agree; 4.21 – 5.00 = Strongly Agree

Table 8 presents the factors affecting technical skills related to curriculum and policy. The table revealed that most of the respondents agree that the relevance and alignment of the K–12 curriculum to industry standards determine how applicable and useful the technical skills learned in school will be for future employment having an average weighted value of 4.05 followed by agree that government policies and resource allocation to public schools directly impact the quality of technical-vocational education, particularly in terms of funding for equipment, training, and facilities having an average weighted value of 4.02 as compared to agree that the design and content of TLE/TVL modules affect the depth of students' technical knowledge and their ability to perform practical tasks having an average weighted value of 3.83. The mean on this aspect is 3.95, verbally interpreted as "agree." The findings stressed that most of the respondents agree that the relevance and alignment of the K–12 curriculum to industry standards determine how applicable and useful the technical skills learned in school will be for future employment, which implies that curriculum and policy factors affect technical skills. connotes that the relevance and alignment of the K–12 curriculum to industry standards determine how applicable and useful the technical skills learned in school will be for future employment. In support, DepEd (2019) pointed out that curriculum and policy factors are crucial in shaping students' technical skills, especially when the K–12 curriculum aligns with industry standards. A responsive curriculum helps learners develop practical and employable skills. Thus, the K–12 Technical-Vocational-Livelihood (TVL) curriculum is tailored to meet the competencies defined by the Technical Education and Skills Development Authority (TESDA). Further, aligning education with industry demands increases graduate employability. Additionally, it emphasizes that coherent policies in vocational education foster innovation and workforce readiness. An industry-aligned curriculum is, therefore, vital for equipping students with essential technical expertise for employment.

Table 9. Grand Mean on the Factors Affecting Technical Skills

Factors	Factors Affecting the Technical Skills	
	Mean	Description
1. Teacher Related Factor	4.04	Agree
2. Student Related Factor	3.95	Agree
3. Resource and Facility Factor	3.88	Agree
4. Socio-Economic and Family Factor	3.86	Agree
5. Curriculum and Policy Factors	3.95	Agree
Grand Mean	***3.94***	***Agree***

Legend: 1.00 – 1.80 = Strongly Disagree; 1.81 – 2.60 = Disagree; 2.61 – 3.40 = Neither Disagree nor Agree; 3.40 – 4.21 = Agree; 4.21 – 5.00 = Strongly Agree

Table 9 presents the factors affecting technical skills. It can be observed that teacher-related factors had the highest mean of 4.04, verbally interpreted as "agree," followed by student-related factors and curriculum and policy factors, both having a mean of 3.95, verbally interpreted as "agree," as compared to socio-economic and family factors, having a mean of 3.86, verbally interpreted as "agree." The grand mean on this aspect is 3.94, verbally interpreted as "agree." Thus, teacher-related factors had the highest mean among the factors affecting technical skills, which implies that teacher-related factors had the highest contribution to technical skills among students. In support, Dela Cruz and Abad (2020) point out the fact that teacher-related factors are crucial for students' technical skill development in Technology and Livelihood Education (TLE) and Technical-Vocational-Livelihood (TVL) programs. Research highlights that teachers' competence, instructional strategies, and feedback are key to students' mastery of skills and confidence. Effective guidance from trained instructors enhances performance in technical-vocational courses. The Department of Education emphasizes that teacher capability in providing hands-on learning is essential for students to acquire relevant technical skills, thus underscoring the importance of proficient mentorship in aligning education with industry needs.

Table 10. Test of Significant Difference on the Factors Affecting Technical Skills Among Grade 9 Students when Analyzed According to their Profile

Profile	*Factor That Affecting Technical Skills*			
	H value	***U value***	***Pr<0.05***	***Interpretation***
Sex		2880.5	0.07541	Accept Ho
Age	0.7932		0.6726	Accept Ho
Specialization	5.4491		0.1417	Accept Ho

**p-value < 0.05 level of significance = significant; Reject H_o*
***p-value > 0.05 level of significance = not significant; Fail to Reject H_o*

Table 10 shows the test of significant difference on the factors affecting technical skills among Grade 9 students when analyzed according to their profile. The table revealed that after applying Kruskal Wallis H-test and Mann-Whitney U-test, it yielded a

p-value greater than the level of significance set at 0.05 which implies acceptance of the hypothesis which states that there is no significant difference on the factors affecting technical skills among Grade 9 students when analyzed according to their profile. Thus, male and female, young and old and regardless of specialization were affected with the same factor that affect technical skills. In support, Dela Cruz and Abad (2020) pointed out that both male and female technical-vocational students are similarly influenced by universal factors affecting skill development, including teacher competence, resource availability, and curriculum relevance. Accordingly, environmental and instructional factors shape learning regardless of gender and age. Further, that these factors significantly affect performance without substantial gender differences. Also, equitable access to quality resources and teaching enhances skill development opportunities for all learners, underscoring the importance of effective teaching strategies and adequate facilities in fostering technical skill proficiency across diverse student populations.

Conclusions

It can be concluded that the development of technical skills among Grade 9 students is largely influenced by teacher-related factors, particularly the availability of guidance and constructive feedback. This suggests that effective teaching practices play a central role in helping learners refine their abilities and gain confidence in performing technical tasks. The findings also highlight the importance of students' self-efficacy and parental support, as both contribute significantly to motivation, persistence, and skill improvement. Moreover, access to digital technologies enhances students' learning experiences by providing opportunities for simulation-based practice and innovation. The alignment of the K–12 curriculum with industry standards ensures that the skills learned in school are relevant and applicable to real-world employment. Lastly, the absence of significant differences across demographic profiles implies that factors influencing technical skills affect all students similarly, regardless of sex, age, or specialization. Thus, it is underscored the need for continuous teacher development, curriculum enhancement, and the integration of digital tools and parental engagement to strengthen technical-vocational education.

Recommendations

Based on a comprehensive analysis of the findings and conclusions, several key recommendations have been proposed. Firstly, the Department of Education is urged to implement ongoing professional development programs for educators, emphasizing technical-vocational teaching methods, learner-centered approaches, and effective feedback strategies aimed at enhancing students' technical skill acquisition. Secondly, it is recommended that schools invest in modern digital technologies, simulation tools, and information and communication technology (ICT) resources. These investments are expected to provide students with practical, hands-on experiences that foster innovation and technical proficiency.

Additionally, it is advised that Parent-Teacher Associations (PTA) arrange orientation sessions, workshops, and communication platforms to engage parents

actively in supporting and motivating their children in technical-vocational education. This recognizes the critical role that family involvement plays in enhancing student persistence and building confidence.

Furthermore, the Department of Education and local school administrators are encouraged to regularly review and update the K–12 Technical-Vocational curriculum to ensure it remains aligned with current industry practices, thereby equipping students with skills that are both employable and market-ready. Lastly, future researchers are encouraged to utilize the results of this study as a benchmark for further inquiries into this field.

Compliance with Ethical Standards

The researchers ensured the anonymity of the research participants and confirmed that consent was freely given for data collection related to this study. All information was stored securely and was destroyed after the study was completed. Confidentiality was strictly maintained. Additionally, the researchers strictly avoided plagiarism and ensured that there was no bias in the interpretation of the findings. The researchers strictly adhered to the highest standards of academic integrity, using the results of this study solely for research purposes. Further, the researchers utilized AI software for grammar checks and paraphrasing. This careful approach reinforced the reliability of the research and enhanced the credibility of the findings. This careful attention to detail not only fostered trust among participants but also positioned the study as a valuable contribution to the existing body of knowledge. We expect the findings to guide future research and practical applications in the field. By implementing these rigorous safeguards, the team aimed to contribute valuable insights to the field while upholding ethical standards throughout the research process.

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