

Impact Assessment of Industrial Performance, Efficiency, and Productivity of NEUST Mechanical Engineering Graduates

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Abstract- *This study evaluates the industrial performance, efficiency, and productivity of Mechanical Engineering graduates from Nueva Ecija University of Science and Technology (NEUST) and examines the influence of academic preparation on these outcomes. Using a quantitative descriptive-correlational design, data were collected from graduates employed in industrial sectors through structured questionnaires. Results revealed that graduates demonstrate high levels of technical competence, work quality, efficiency, and productivity, indicating strong workplace readiness. Academic preparation was found to have a significant relationship with and predictive influence on technical competence, as well as on efficiency and productivity. However, it showed no significant effect on work quality, suggesting that this aspect is more influenced by workplace experience, supervision, and organizational practices. The findings support Human Capital Theory and Systems Theory, emphasizing that workplace performance is shaped by both academic and experiential factors. Despite limitations in the analysis of On-the-Job Training (OJT) due to data constraints, the study highlights its importance in developing practical skills. Overall, the study underscores the need for stronger industry-academe collaboration, enhanced practical training, and continuous curriculum improvement to ensure alignment with evolving industry demands and to further enhance graduate performance.*

Index Terms— *Academic Preparation, Industrial Performance, Mechanical Engineering Graduates, Productivity, Workplace Efficiency*

I. INTRODUCTION

The rapid advancement of industrial technologies and the increasing demands of global competitiveness have placed significant pressure on higher education institutions to produce mechanical engineering graduates who are not only technically proficient but

also efficient and productive in real-world industrial settings. Modern industries require engineers who can demonstrate strong technical performance, operational efficiency, and consistent productivity upon entering the workforce. [1] However, a persistent gap remains between academic preparation and actual industry expectations. [2][3]

In the Philippines, the Commission on Higher Education (CHED) mandates state universities and colleges to conduct graduate tracer studies and performance assessments to ensure that educational outcomes align with industry needs. [4] Despite this requirement, most evaluations focus primarily on employment outcomes rather than on graduates' actual workplace performance, efficiency, and productivity. A tracer study of Nueva Ecija University of Science and Technology (NEUST) Off-Campus Program graduates from 2015 to 2018 reported high employment rates but highlighted the need for deeper assessment of workplace competencies. [5]

Globally, studies have identified a mismatch between engineering graduates' competencies and employer expectations. Research in India and Europe indicates that many graduates lack practical skills, problem-solving abilities, and essential non-technical competencies such as communication and teamwork. [2][3][6]

The evolving field of mechanical engineering, particularly with the emergence of Industry 4.0 and 5.0, further intensifies these challenges. Engineers are now expected to integrate advanced technologies such as artificial intelligence, the Internet of Things, and cyber-physical systems into industrial processes.

[7][8] Productivity is also measured through comprehensive frameworks such as Overall Equipment Effectiveness (OEE), which considers efficiency, performance, and quality. [15][16]

This study addresses these gaps by evaluating the industrial performance, efficiency, and productivity of NEUST mechanical engineering graduates to support industry–academe alignment and curriculum improvement.

1.2 Theoretical / Conceptual Framework

This study is anchored on Human Capital Theory, which explains that education and training build knowledge, skills, and productivity-related capabilities that improve later workplace performance. Recent reviews continue to treat human capital theory as the dominant framework in the economics of education, with a focus on labour-productivity-improving skills, and they link educational development to human capital productivity. [15][16] The study also draws from Systems Theory, which views organizational performance as the result of interacting inputs, processes, and outputs; in this framework, training is treated as an input that affects organizational performance through the way it is applied within the system. A recent review and a meta-analysis both use systems theory to explain the positive relationship between training and organizational performance. [17][18] Finally, the study uses Overall Equipment Effectiveness (OEE) as an applied conceptual analogy for evaluating workplace effectiveness, since OEE measures performance through availability, performance, and quality; recent reviews describe it as a key performance indicator used to measure industrial productivity and identify improvement projects. [19][20] Taken together, these frameworks support the idea that the academic preparation of NEUST Mechanical Engineering graduates influences their industrial performance, efficiency, and productivity.

1.3 Research Paradigm

The research paradigm follows the Input–Process–Output (IPO) Model:

Input: Profile of NEUST Profile of Nueva Ecija University of Science and Technology Mechanical Engineering graduates, including academic preparation, internship/OJT experience, skills acquired, and selected employment characteristics (e.g., type of industry, job position, and length of employment)

Process: Administration of structured survey questionnaires; collection and statistical analysis of data on industrial performance, efficiency, and productivity.

Output: Evidence-based assessment of graduate performance; identification of strengths and skill gaps; recommendations for curriculum enhancement and industry–academe alignment.

1.4 Statement of the Problem

This study aims to assess the industrial performance, efficiency, and productivity of NEUST Mechanical Engineering graduates. Specifically, it seeks to answer the following questions:

1. What is the level of industrial performance of NEUST Mechanical Engineering graduates in terms of technical competence and work quality?
2. What is the level of efficiency of the graduates in completing assigned tasks and meeting industry standards?
3. What is the level of productivity of the graduates in their respective workplaces?
4. Is there a significant relationship between academic preparation and industrial performance outcomes?
5. What factors significantly predict the industrial performance, efficiency, and productivity of NEUST Mechanical Engineering graduates?

1.5 Hypotheses of the Study

H_{01} : There is no significant relationship between academic preparation and the industrial performance of NEUST Mechanical Engineering graduates.

H₀₂: There is no significant relationship between academic preparation and the efficiency of graduates in their workplaces.

H₀₃: There is no significant relationship between academic preparation and the productivity of graduates.

H₀₄: Academic preparation variables (coursework, internship, laboratory training) do not significantly predict industrial performance, efficiency, and productivity.

1.6 Scope and Delimitation of the Study

This study focuses on graduates of the Bachelor of Science in Mechanical Engineering (BSME) program of Nueva Ecija University of Science and Technology (NEUST) who are currently employed in industrial-related sectors, including manufacturing, construction, energy, automotive, HVAC, and other allied industries. Only graduates with at least six months of work experience at the time of data collection are included to ensure sufficient exposure for evaluating workplace performance. Whenever possible, employers or immediate supervisors are also involved to provide external assessments of graduates' industrial performance, efficiency, and productivity.

The study is limited to three key dimensions: industrial performance, specifically technical competence and work quality; efficiency, defined as task completion and adherence to industry standards; and productivity, measured by output relative to expectations. Data are collected using structured survey questionnaires and analyzed through descriptive and correlational statistical methods. A purposive sampling technique is employed, with total enumeration applied when the eligible population is small. The findings are primarily generalizable to NEUST BSME graduates meeting the study criteria, with possible relevance to similar institutions in the Philippines.

1.7 Significance of the Study

NEUST Administration and Curriculum Developers — The results will provide evidence-based data on the strengths and gaps in the current BS Mechanical

Engineering curriculum, enabling targeted revisions to enhance industry relevance and graduate competitiveness.

Faculty Members — Insights on specific areas of graduate underperformance will inform improvements in instructional delivery, laboratory training, and the integration of industry-relevant competencies.

NEUST Mechanical Engineering Students — The study will raise awareness about the specific performance standards and competency expectations of the industrial sector, motivating students to proactively develop the necessary skills during their academic program.

Future Researchers — The study will serve as a reference for related research on graduate performance assessment, employability studies, and curriculum evaluation in engineering education.

Commission on Higher Education (CHED) — Results may inform policy formulation and quality assurance standards for engineering programs in state universities and colleges.

1.8 Definition of Terms

Industrial Performance — The level of technical competence and quality of work demonstrated by mechanical engineering graduates in their respective industrial workplaces.

Efficiency — The ability of graduates to complete assigned tasks within expected timeframes and in accordance with established industry standards and procedures.

Productivity — The measurable output of graduates relative to the resources and time invested, reflecting their overall contribution to workplace operations (Razali et al., 2016). [15]

Academic Preparation — The totality of knowledge, skills, and competencies acquired by graduates through coursework, laboratory training, industrial internships, and other academic activities during their BS Mechanical Engineering program at NEUST.

Employability Skills — The set of technical and non-technical skills (including communication, teamwork, problem-solving, and professional knowledge) that enable graduates to gain and maintain productive employment (Kovesi, 2019). [3]

Mechanical Engineering Graduates — Individuals who have completed and earned the degree of Bachelor of Science in Mechanical Engineering from NEUST.

Industry–Academe Alignment — The degree to which the curriculum and training provided by an academic institution match the competency requirements and expectations of the industrial sector.

II: LITERATURE REVIEW (REVIEW OF RELATED LITERATURE AND STUDIES)

2.1 Industrial Performance and Competency Requirements of Engineering Graduates

The preparedness of engineering graduates for industrial work has long been a concern in engineering education. Martin et al. identified two key domains of competence: the science of engineering, which involves applying theoretical and mathematical knowledge, and the practice of engineering, which focuses on solving real-world problems. Their findings suggest that while academic institutions emphasize theory, industries prioritize practical application. [6]

Global studies reinforce this gap. Research involving Thai and multinational companies highlights the need for graduates to possess communication, cross-cultural collaboration, and technical adaptability skills. [1] Similarly, Indian industry executives report that engineering curricula remain largely theoretical, limiting students' exposure to real-world applications. [2] In Europe, industry expectations have evolved to include not only technical expertise but also social intelligence, design thinking, and virtual collaboration skills. [3]

In the Philippine context, studies show high employability among engineering graduates but also reveal gaps in practical preparedness. Research on graduates from the University of Rizal System (URS)

found strong employment outcomes but emphasized the need for improved curriculum delivery, facilities, and technical resources. [4] Another study identified communication, design, production, and leadership skills as key factors influencing employability. [17] At Nueva Ecija University of Science and Technology (NEUST), findings indicate that traditional lecture-based instruction limits students' readiness for real-world engineering tasks. [18]

2.2 Efficiency and Productivity Measurement in Industry

Productivity is a fundamental indicator of industrial performance and profitability. [15] It is typically assessed through economic, industrial, and manufacturing perspectives. The economic view defines productivity as the ratio of outputs to inputs, while industrial approaches use metrics such as Overall Equipment Effectiveness (OEE), and manufacturing perspectives emphasize machine efficiency and product quality. [15]

Salunke et al. described productivity as a quantitative relationship between output and input, highlighting that techniques such as time study, method study, and layout optimization can significantly improve efficiency by reducing wasted effort. [16] Yazdi et al. demonstrated that evaluating system performance through time-study-based OEE analysis is essential before implementing improvements in industrial systems. [19]

Studies in the automotive sector further show that efficiency can be enhanced through effective management tools, employee involvement, and elimination of process inefficiencies. [20] Additionally, sustainability has emerged as a key dimension of industrial performance. Cai's sustainability assessment model demonstrates that integrating environmental, economic, and energy considerations leads to improved manufacturing outcomes. [21]

2.3 The Role of Industrial Training, Internships, and Academic Preparation

Industrial training and internships are essential in bridging the gap between academic preparation and workplace performance. Setyadi (2021) found that

industrial work practices contribute 30% to job readiness, while workshop infrastructure contributes 28.6%, with a combined effect of 58.6%. [22] Similarly, Akhyar et al. reported that industrial apprenticeship and self-efficacy significantly influence readiness, contributing 68.9%. [23]

A study in a U.S. university found that both coursework and internships strongly influence students' perceptions of manufacturing careers, with differences observed between students with and without industry exposure. [24] However, the COVID-19 pandemic negatively affected these experiences, with 72.7% of students reporting reduced preparedness due to limited access to hands-on training. [6]

2.4 The Evolving Role of Mechanical Engineering in Industry

Mechanical engineering continues to evolve with advancements in technology. A bibliometric analysis of Scopus-indexed studies (2015–2024) highlights developments in advanced manufacturing, Industry 4.0, sustainability, and digital transformation. [8] The transition to Industry 5.0 requires engineers to integrate artificial intelligence, the Internet of Things, and cyber-physical systems into industrial processes, demanding new competencies and interdisciplinary approaches. [7]

In the employability context, studies show that factors such as communication, leadership, curriculum relevance, and practical experience significantly influence graduate outcomes. [17] These findings underscore the need for institutions like NEUST to align academic preparation with the evolving, multidimensional demands of the industry.

III: METHODS AND PROCEDURES

3.1 Research Design

This study utilizes a quantitative descriptive-correlational research design to examine the industrial performance, efficiency, and productivity of NEUST Mechanical Engineering graduates. The descriptive component identifies the levels of these variables, while the correlational component determines the relationships between academic

preparation and workplace outcomes. This design is appropriate for analyzing existing conditions without manipulating variables and is consistent with prior employability studies in the Philippines, including NEUST tracer studies and URS BSME research. [5][4]

3.2 Locale of the Study

The study is conducted at Nueva Ecija University of Science and Technology (NEUST), located in Cabanatuan City, Nueva Ecija, Philippines. The university is a leading higher education institution in Central Luzon offering a BS Mechanical Engineering program. The locale is selected due to the availability of graduate records and alumni networks. Data collection will also extend to various industrial workplaces across the Philippines where graduates are employed. The institution operates under the mandate of the Commission on Higher Education (CHED) to conduct graduate performance assessments. [5]

3.3 Population of the Study

The population includes NEUST Bachelor of Science in Mechanical Engineering (BSME) graduates employed in industrial sectors such as manufacturing, construction, energy, automotive, and HVAC. Only those with at least six months of work experience are included to ensure adequate exposure for performance evaluation.

3.4 Sampling Technique

Purposive sampling is used to select respondents who meet specific criteria: (1) NEUST BSME graduates, (2) currently employed in industrial-related fields, and (3) with at least six months of work experience. Graduates not aligned with mechanical engineering practice are excluded. Participants will be identified through the NEUST Alumni Affairs Office, alumni networks, and social media platforms.

If the population size can be determined, the sample size will be computed using Slovin's formula with a 5% margin of error. In cases where the number of eligible respondents is small, total enumeration may be applied to ensure comprehensive data collection.

3.5 Respondents of the Study

The respondents consist of qualified NEUST BSME graduates currently employed in industrial sectors. They will serve as primary respondents and complete the Graduate Self-Assessment Questionnaire, which evaluates their industrial performance, efficiency, productivity, and academic preparation.

3.6 Description of the Instruments

Data will be collected using a structured questionnaire developed by the researchers. The instrument includes sections on graduate profile, industrial performance, efficiency, productivity, and academic preparation, using a 5-point Likert scale. It also includes open-ended questions for qualitative insights. The design is based on established competency frameworks and employability models used in global and Philippine studies. [1][3][17]

3.7 Administration of Instruments

The questionnaires will be administered through both online platforms (e.g., Google Forms) and face-to-face distribution, depending on respondent accessibility. Participants will receive informed consent forms and study details prior to participation. Follow-ups will be conducted to improve response rates.

3.8 Validity and Reliability of the Instruments

Content validity will be ensured through expert evaluation by mechanical engineering faculty, industry practitioners, and a research methodologist. Revisions will be made based on their feedback. Reliability will be tested through a pilot study involving at least 30 respondents, with internal consistency measured using Cronbach's Alpha, targeting a minimum value of 0.70. Similar validation procedures have been applied in related studies. [22][4]

3.10 Data Gathering Procedure

The following steps will be observed:

1. Secure approval from the NEUST Research Ethics Committee and the College of Engineering Dean's Office.

2. Obtain the list of BS Mechanical Engineering graduates from the Alumni Affairs Office and the Registrar.

3. Identify and contact employed graduates through alumni databases, social media groups, and referral networks.

4. Screen respondents against the inclusion criteria.

5. Distribute questionnaires to qualifying graduate respondents and their employers/supervisors.

6. Collect completed questionnaires within an agreed timeframe (approximately 4–6 weeks).

7. Encode, clean, and organize data for statistical analysis.

3.11 Data Analysis Technique

The collected data will be analyzed using the following statistical tools:

Descriptive Statistics — Frequency, percentage, mean, and standard deviation will be used to summarize respondent profiles and describe the levels of industrial performance, efficiency, and productivity.

Pearson Product-Moment Correlation — This will be used to determine the strength and direction of the relationship between academic preparation variables and industrial performance outcomes.

Multiple Regression Analysis — This will be conducted to identify which academic preparation variables (e.g., coursework quality, internship experience, laboratory training, licensure status) significantly predict industrial performance, efficiency, and productivity. This approach is consistent with analytical techniques used in related studies. [23][17]

All statistical analyses will be performed using appropriate software (e.g., SPSS or equivalent) at a 0.05 level of significance.

3.12 Ethical Concerns

The study will adhere to the ethical standards for research involving human participants:

Informed Consent — All respondents will be informed of the purpose, procedures, potential risks, and benefits of the study. Participation is voluntary, and respondents may withdraw at any time without penalty.

Confidentiality and Anonymity — All data collected will be treated with strict confidentiality. Personal identifiers will be removed during data encoding, and results will be reported in aggregate form only.

Data Privacy — The study will comply with the Philippine Data Privacy Act of 2012 (RA 10173). Personal data will be stored securely and will only be accessible to the research team.

No Harm Principle — The study poses minimal risk to respondents. No sensitive or invasive information will be collected.

Ethics Review — The study protocol and instruments will be submitted to the NEUST Research Ethics Committee for review and approval prior to data collection.

IV: RESULTS AND DISCUSSION

4.1 Overview of the Study

This chapter presents the analysis and interpretation of data collected from 56 NEUST Mechanical Engineering graduates currently employed in industrial-related sectors from year 2018-2025. The study aims to assess the graduates' industrial performance (technical competence and work quality), efficiency, and productivity, and to determine the relationship and predictive role of academic preparation on these workplace outcomes.

The analysis follows the research problems stated in Chapter 1 and applies the statistical tools identified in Chapter 2, namely descriptive statistics, Pearson correlation, and multiple regression analysis, at a 0.05 level of significance.

4.2 Level of Industrial Performance, Efficiency, and Productivity

Table 1. Descriptive Statistics of Key Variables (n = 56)

Variable	Mean (M)	Standard Deviation (SD)	Interpretation
Academic Preparation	4.123	0.671	High
Technical Competence	4.135	0.596	High
Work Quality	4.359	0.567	High
Efficiency	4.327	0.542	High
Productivity	4.296	0.533	High

The results show that all variables obtained high mean ratings, indicating that graduates perceive themselves as performing well across all domains.

In terms of industrial performance, both technical competence (M = 4.135) and work quality (M = 4.359) are rated high, suggesting that graduates possess strong technical knowledge and produce quality outputs in their respective workplaces. Among the two, work quality obtained the highest mean, indicating that graduates prioritize accuracy and output standards.

For efficiency (M = 4.327), the results indicate that graduates are able to complete tasks within expected timeframes and adhere to industry standards. Similarly, productivity (M = 4.296) reflects that graduates are capable of producing consistent and meaningful outputs in their work environments.

Academic preparation (M = 4.123) also received a high rating, implying that graduates perceive their educational background as relevant and useful in their professional roles.

The low standard deviation values indicate consistency in responses, suggesting that the perceptions are shared among most respondents.

Figure 1. Mean Ratings Across Domains



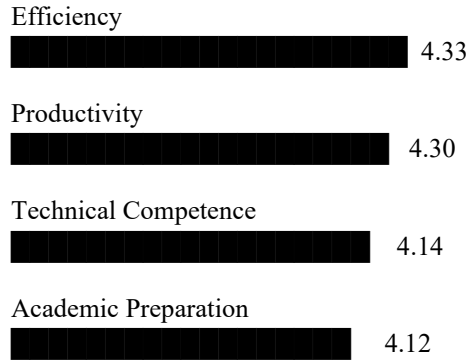


Figure 1 shows that workplace performance indicators (industrial performance, efficiency, productivity) are slightly higher than academic preparation. This suggests that while academic preparation provides a strong foundation, skills are further enhanced through actual workplace experience, consistent with the Systems Theory, where outputs are influenced not only by inputs (education) but also by processes (workplace exposure).

4.3 Relationship Between Academic Preparation and Workplace Outcomes

Table 2. Pearson Correlation Between Academic Preparation and Outcomes

Outcome Variable	r-value	p-value	Interpretation
Technical Competence	0.525	0.0059	Significant, Moderate
Work Quality	0.349	0.0806	Not Significant
Efficiency	0.357	0.0732	Not Significant
Productivity	0.322	0.109	Not Significant

The results indicate that academic preparation is positively related to all workplace outcomes, meaning that better academic preparation tends to correspond with higher performance.

However, only technical competence shows a statistically significant relationship ($p < 0.05$). This leads to the rejection of H_{01} (for technical competence) and supports the idea that academic preparation plays a crucial role in developing

technical skills, consistent with Human Capital Theory.

On the other hand:

- H_{02} (efficiency) → Not rejected
- H_{03} (productivity) → Not rejected

since their relationships are not statistically significant.

This implies that efficiency and productivity are influenced by other factors, such as workplace training, supervision, and organizational systems, rather than academic preparation alone.

Figure 2. Strength of Correlations

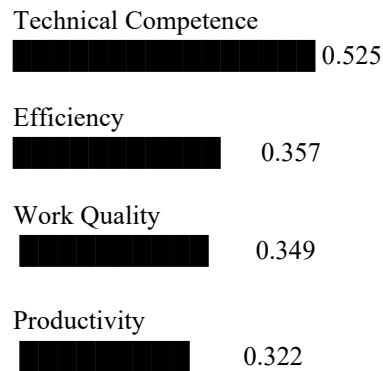


Figure 2 highlights that technical competence has the strongest relationship with academic preparation. This supports existing literature (Chapter 2) that academic programs are more effective in developing technical knowledge than behavioral or performance-based outcomes.

4.4 Predictors of Industrial Performance, Efficiency, and Productivity

Table 3. Regression Results

Outcome Variable	B	SE	t	p-value	Interpretation
Technical Competence	0.553	0.168	3.292	0.0035	Significant
Work Quality	0.331	0.174	1.898	0.0716	Not Significant

Outcome Variable	B	SE	t	P-value	Interpretation
Efficiency	0.408	0.160	2.545	0.0188	Significant
Productivity	0.361	0.160	2.252	0.0352	Significant

The regression results show that academic preparation significantly predicts:

- Technical Competence
- Efficiency
- Productivity

Thus, H_{04} is partially rejected, since academic preparation has predictive power for several outcome variables.

The strongest predictor is technical competence, reinforcing the role of education in building core engineering skills. Efficiency and productivity are also influenced, indicating that academic preparation contributes to work performance behaviors, although not as strongly.

However, work quality is not significantly predicted, suggesting that it depends more on experience, supervision, and workplace standards, rather than academic preparation alone.

Table 4. Model Fit Indices

Outcome Variable	R ²	Adjusted R ²	Interpretation
Technical Competence	0.346	0.221	Moderate Fit
Work Quality	0.223	0.075	Weak Fit
Efficiency	0.278	0.141	Moderate Fit
Productivity	0.253	0.111	Moderate Fit

The model explains 34.6% of the variance in technical competence, which is the highest among all outcomes. This indicates that academic preparation is a strong contributor to technical skill development.

Lower R² values for other variables suggest that additional factors (e.g., work environment, training, leadership) influence workplace performance.

Figure 3. Model Fit Comparison

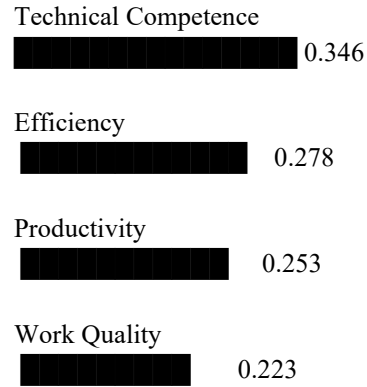


Figure 3 confirms that academic preparation is most effective in explaining technical competence, consistent with both Human Capital Theory and your conceptual framework.

4.5 Discussion of Findings

The findings show that graduates with stronger academic preparation tend to demonstrate better workplace performance, particularly in technical competence. This consistent pattern across correlation and regression analyses strengthens the reliability of the results. The significant relationship between academic preparation and technical competence indicates that knowledge and skills gained during academic study are directly applicable to workplace demands, supporting Human Capital Theory.

While academic preparation also shows positive relationships with work quality, efficiency, and productivity, these associations are weaker and not statistically significant in correlation analysis. This suggests that workplace performance is influenced not only by academic background but also by factors such as experience, supervision, organizational culture, and adaptability. This aligns with Systems Theory, which emphasizes the interaction of multiple factors in shaping performance outcomes.

Regression analysis further reveals that academic preparation significantly predicts technical

competence, efficiency, and productivity, but not work quality. This implies that technical competence is strongly linked to formal education, whereas work quality is more influenced by experience, organizational standards, and feedback mechanisms.

Additionally, the relatively low R^2 values indicate that academic preparation explains only part of workplace performance, confirming the presence of other influencing variables. The OJT duration variable could not be analyzed due to lack of variation, highlighting a limitation in data measurement.

Overall, academic preparation is an important but not sole determinant of workplace performance, with other experiential and organizational factors playing significant roles.

V – SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Summary of Findings

This study examined the industrial performance, efficiency, and productivity of NEUST Mechanical Engineering graduates and the influence of academic preparation on these outcomes. The findings indicate that graduates demonstrate high levels of performance, efficiency, and productivity, suggesting that they are generally well-prepared for workplace demands. Academic preparation was found to be significantly related to technical competence, confirming that the knowledge and skills gained during academic training are directly applicable to engineering practice.

Moreover, academic preparation significantly predicts technical competence, efficiency, and productivity, highlighting its important role in workplace performance. However, it was not found to significantly influence work quality, indicating that this aspect may be shaped more by workplace experience, supervision, and organizational practices. Overall, workplace performance is influenced by both academic preparation and non-academic factors, emphasizing the importance of combining formal education with practical exposure.

5.2 Conclusions

The study concludes that NEUST Mechanical Engineering graduates demonstrate strong industrial performance, particularly in technical competence and work quality, and are capable of meeting industry standards. They also exhibit high levels of efficiency and productivity, enabling them to contribute effectively to organizational goals. Academic preparation has a significant relationship with technical competence but shows no significant correlation with efficiency and productivity, suggesting that these aspects are influenced by additional workplace factors.

Further, academic preparation is a significant predictor of technical competence, efficiency, and productivity, but not work quality. This implies that while education plays a crucial role, it is not the sole determinant of performance. Workplace performance is shaped by both academic and experiential factors. Although the effect of OJT could not be statistically confirmed due to limited data variation, it remains important in developing practical skills and industry readiness.

5.3 Recommendations

Based on the conclusions, the following recommendations are proposed:

For Nueva Ecija University of Science and Technology

Strengthen collaboration with industry partners to ensure that the curriculum remains relevant and aligned with current industry needs. Enhance the integration of practical and industry-based learning experiences into the program.

For Faculty Members

Incorporate more hands-on activities, simulations, and real-world problem-solving tasks into instruction. Update course content to include industry-relevant tools and technologies such as CAD, automation systems, and engineering software. Emphasize the development of technical, analytical, and communication skills.

.For Students

Actively participate in internships, training programs, and skill development activities. Develop both technical competencies and soft skills, such as teamwork, adaptability, and communication. Take the initiative to gain exposure to industry practices and emerging technologies.

For Industry Partners

Provide structured and meaningful OJT programs that offer real-world experience and skill development. Support graduates through mentorship, training, and continuous learning opportunities..

For Future Researchers

Use a larger sample size to improve the generalizability of results. Improve the measurement of OJT by considering its duration, quality, and type of experience. Include additional variables such as work environment, training programs, and organizational factors. Conduct longitudinal studies to better understand the development of workplace performance over time

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