

## ASSESSMENT OF THE LEVEL OF ACADEMIC PERFORMANCE OF METALWORK TECHNOLOGY STUDENTS IN TECHNICAL COLLEGES IN SOUTH-SOUTH, NIGERIA

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### Abstract

*This study investigated the levels of academic performance of metalwork technology students in technical colleges in South-South, Nigeria. One research question was raised to guide the study and a descriptive research design was used for the study. The population of the study was drawn from technical colleges in South-South states of Nigeria, and a stratified sampling technique was used to sample 880 vocational II and III students. The instruments used for data collection was a Metalwork Technology Performance Test, the instrument consisted of adapted past questions from National Business and Technical Examination Board, which has been validated by experts of metalwork technology. The reliability coefficient of the instrument was established using Cronbach Alpha that yielded a reliability coefficient of .92 and the instrument was administered to the respondents with the aid of trained research assistants. Percentage was used to answer the research question and t-test was used to test the only hypothesis. The findings revealed low level of academic performance of students in metalwork technology and there was a significant difference between in the levels of academic performance between male and female students in metalwork technology in technical colleges. Based on the findings, the following recommendations were made; qualified and experienced technical workshop instructors should be recruited to teach metalwork students, regular professional development programme on current teaching methodologies should be provided to the instructors to improve the academic performance of students, among others.*

**Keywords:** *Assessment, Academic Performance, Metalwork Technology and Technical Colleges*

### Introduction

Education and training are the foundations of human capital development as they play important roles in equipping the individual person with knowledge, skills and abilities necessary for personal and national development, as they enhance productivity, promotes innovations, societal cohesion, economic growth and the overall well-being of the individual and the nation. Consequently, Technical Colleges are education and training institutions that enhance the well-being of human being.

Technical Colleges are educational and training institutions where students are trained to acquire knowledge, skills and attitude relating to various trades or occupations to become craftsmen and advanced craftsmen. Technical Colleges provides secondary level of education and training in Technical Vocational Education and Training (TVET) that comprised of general education and practical skills relating to a chosen trade and upon the students' graduation, they could be gainfully employed in the private or public sector, set-up an entrepreneurial initiative or further their education into tertiary institutions. Therefore, metalwork technology is a course offered by mechanical trades' students as a foundational course in Technical Colleges.

Metalwork technology according to Nwaodo and Ogbonna (2019) is a course that is related with the activities of metal fitting, forging, machine shop practice and fabrication and welding. The objectives of metalwork technology according to the National Board for Technical Education (NBTE) (2004) is to train mechanical trade students to be proficient enough with skills, knowledge and have a good working principle of general metalwork, so as to design, fabricate simple metal components and carry out maintenance on simple metal mechanisms. However, to ascertain the effectiveness of these objectives, it requires a thorough assessment of the students.

On the other hand, assessment according to Curtis (2010) is the process of gathering evidence, making judgements and drawing conclusions about students' performance and achievements. Omeje, et al. (2019) described assessment as the process of evaluating the performance of the individuals in programmes in order to determine the learning outcomes in terms of knowledge, skills, attitude and ability for effective delivery of instructional programmes objectives. Similarly, Anyiekan (2019) explained that assessment is the process of making judgements about the performance of students in carrying out their practical tasks and theoretical knowledge, based on the learning experiences they are exposed to, as contained in a prescribed curriculum to determine their levels of academic performance. Therefore, the term levels of academic performance in accordance with Hornby (2010) is the degree to which a students has attained specific educational objectives within a given period of time, which is often expressed in a descriptive categories such as; high, average or low performances. It serves as a relative measure or benchmark of achievement, that shows the extent to which a student meets, exceeds or falls short of expected standards.

Moreover, Steinmayr, et al. (2015) noted that in a formal educational setting, these levels are usually determined through numerical measures such as; examination scores, Grade Point Average (GPA) and standardized test scores, as well as measurable assessments like teachers evaluation that are symbolized with scores. Furthermore, Aremu (2001) described the classification of academic performance into levels that enables educators and researchers to interpret, compare and monitor students' achievement more effectively, as a high level of academic performance indicates mastery of subject content and the ability to apply knowledge and skills to problem-solving situations. An average level suggests adequate competence, meeting the minimum requirements set by the curriculum and a poor level reflect insufficient mastering which may hinder progression to higher levels of learning or career readiness or advancement. Also, the level of academic performance in line with Davis and Francis (2021) is shaped by both structural and personal factors; structural factors include the quality of instruction, availability of learning resources and adequacy of instructional time. While Widodo and Astuti (2024) noted that levels of academic performance can as well be shaped by personal factors such as; motivation, self-efficacy and learning strategies, moreover, in the context of TVET, academic performance levels reflect the degree of competence in both cognitive and psychomotor domains, that emphasizes the ability to integrate theoretical knowledge and practical skills in workplace application.

However, this study is rooted on Albert Bandura social cognitive learning theory of 1977. This theory posits that learning results from the dynamic interaction of personal factors such as; belief, attitude, behavioural pattern and environmental influences. Within these outlooks, students' confidence, motivation and persistence interact with instructional quality and available learning resources are used to determine their academic performance. Thus, in TVET settings, observational learning such as; watching an instructor demonstrating a fitting exercise or machine operation is an important avenue or channel for skill development. Furthermore, students believe in their ability to successfully execute these tasks (self-efficacy) directly affect their willingness to engage in practice, perseverance through challenges and ultimately achieve higher performance levels. Therefore, integrating Bandura perspective provides a thorough framework to investigate academic performance in TVET as this theory illuminate the motivational and behavioural mechanisms that drive skill acquisition, as it offers a strong theoretical viewpoint through which to understand and enhance students' levels of academic performance in Technical Colleges.

Thus, the level of academic performance of students in Technical Colleges is of great importance to researchers, hence, Benimpeiye, et al. (2020) carried out a study on students' variables and their academic performance in Technical Colleges in Ogoja educational zone, Cross-River State and the study revealed that positive attitude, students with interest and high self-concept significantly influence students' academic performance. Also, Olufemi, et al. (2018) investigated factors affecting students' academic performance in Colleges of Education in South-West Nigeria and the findings revealed that students' factors, parental background, school and teachers' factors have serious influence on students' academic performance. Similarly, Rusol, et al. (2023) carried out a study to determine reasons for poor among under-graduate students and the findings showed; social strategies and some engagement techniques required to improve students' academic performance. Also, Ayoubi, et al. (2025) investigated gaps responsible for poor academic performance of students and the findings provided a valuable insight for developing effective pathways to improve academic performance of students. To this end, this study was designed to assess the levels of academic performance of metalwork technology students in Technical Colleges in South-South Nigeria.

### **Statement of the Problem**

Metalwork technology is a fundamental subject to mechanical trades' students in Technical Colleges as it is intended to equip students with strong foundational base in design, fitting, forging and welding processes. The subject plays an important role in promoting technological competence for all mechanical trades' students.

However, recent reports have shown that metalwork technology students have been recording low level of academic performance in National Business and Technical Examination Board (NABTEB) examinations. This was confirmed by Imandojemu (2008) as he observed a decline in the final year result of metalwork students. Also, Nwaodo and Ogbonna (2019) noted that employers have expressed concern about mechanical craftsmen from Technical Colleges on their inability to competently perform some fundamental tasks in metalwork and this may have been caused by some contributing factors. Furthermore, the Chief examiner report of NABTEB (2021) revealed a downward trend on the levels of academic performance of students in metalwork technology.

Therefore, this researchers are worried that without accurate and specific data on the level of students' academic performance, policy makers, curriculum developers and educators may not have a blueprint to use as guide on the intervention to address this performance gaps.

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Consequently, this study seeks to fill this gap by strategically assessing the level of academic performance of metalwork technology students in Technical Colleges.

### **Purpose of the Study**

The purpose of this study is to assess the levels of academic performance of students in metalwork technology in Technical Colleges in South-South Nigeria. Specifically, the study sought to:

Find out the level of academic performance of students in metalwork technology in Technical Colleges in South-South Nigeria

### **Methods**

The study adopted a descriptive survey research design. Descriptive design according to Sunaina (2023) is a method of investigation that serves as a foundational tool for researchers that aimed to observe, record and analyse the intricate details of a particular phenomenon, as it provides a rich and detailed account that aids in understanding, categorizing and interpreting a subject matter. The population of the study comprised of respondents drawn from ten Technical Colleges of the six States of South-South Nigeria. A stratified sampling technique was used to sample 679 male and 201 female students making a total of 880 Vocational II and III students from Technical Colleges.

The instrument used for the study was a Metalwork Technology Performance Test (MTPT), which were made up of past questions of NABTEB which have already been validated by experts of metalwork technology. The reliability of the instrument was established using Cronbach Alpha outside the study sample and it yielded a reliability coefficient ( $r$ ) of .92 which was adjudged to be high. The instrument was administered to the respondents with the aid of trained research assistants that are conversant with the sampled Technical Colleges and the test was conducted the same time in all the sampled Technical Colleges. The researchers received the copies of the performance test from the research assistants and separated 679 males and 206 females that gave 885 error-free copies that represent a 100% return rate. However, percentage was used to answer the research question in accordance with NABTEB grading system which is as follows: 0-39 = F9 (Fail), 40-44 = P8 (Weak Pass), 45-49 = P7 (Pass), 50-54 = C6 (Credit), 60-64 = C4 (Credit), 65-69 = A3 (Good), 70-74 = A2 (Very Good) and 75-100 = A1 (Excellent). Furthermore, t-test was used to test the hypothesis at .05 level of significance

**Results**

**Table 1: Determination of the Mean of Students Academic Performance**

Class Intervals	Frequency	Mid-Point (x)	Fx
73-79	2	76	152
66-72	2	69	138
59-65	5	62	310
52-58	47	55	2582
45-51	153	48	7344
38-44	284	41	11644
31-37	147	34	4998
24-30	172	27	4644
	880		33133

$N = 880; Fx = 33133; X = \text{Mean}; X = \sum fx/N; \text{Mean} = 37.65$

**Research Question 1:** What is the academic performance level of students in metalwork in Technology in Technical colleges in South-South Nigeria?

**Table 2: Interpretation, Grade and Level of Students' Academic Performance in General Metalwork in Technical Colleges in South-South**

Performance (%)	0-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-100
Grade	F9	P8	P7	C6	C5	C4	A3	A2	A1
Interpretation	Fail	Weak Pass	Pass	Credit	Credit	Credit	Good	Very Good	Excellent

The results presented in Table 1 indicate the academic performance levels and corresponding grade distributions in general metalwork among metalwork students in Technical Colleges in South-South Nigeria. The performance test was administered to 880 students, the lowest scores recorded was 18, while the highest was 79, representing the grade categories of fail and excellent. The computed mean score was 37.65, which falls within the performance range of 0-39 as indicated in the Table. This indicates that the students overall academic performance was categorized as Fail. Given the mean score of 37.65, which falls within the “Fail” range (0-39), it was therefore concluded that the overall academic performance of metalwork students was poor.

**Hypothesis 1:** There is no significant difference on the level of academic performance Between male and female students in metalwork technology in Technical Colleges in South-South Nigeria

**Table 3: The t-test of significant difference on the Level of Academic Performance between Male and Female Students in Metalwork Technology in Technical Colleges in South-South Nigeria**

Variables	N	X	SD	Df	t-crit	t-cal	Decision
Males	679	3.63	.52	878	1.96	13.55	reject
Females	201	2.97	.63				

$13.55 > 1.96$

Table 3 shows t-test analysis conducted to investigate the significant difference in the level of academic performance between male and female students in metalwork technology in Technical Colleges in South-South, Nigeria. The result of the analysis revealed that the calculated value of

13.55 was higher than the table value of 1.96. In conclusion, there is a significant difference in the level of academic performance of male and female in metalwork technology in Technical Colleges in favour of male students.

The implications of this findings is that educators need to provide additional supports or resources to help female students in metalwork to catch-up with their male counterpart and it is important to explore the reasons behind this difference, such as; teaching methods, students engagement or societal factors.

### **Findings of the Study**

The findings of this study from data analysis showed as follows;

1. The level of academic performance of metalwork technology students was poor, as evidenced by the mean score of 37.65, which falls within Fail (F9) category.
2. There was a significant difference between male and female level of academic performance that favour the male students.

### **Discussion of Findings**

The study showed that academic performance of metalwork technology students in Technical Colleges in South-South Nigeria was generally low. The reason for this low level of level of academic performance can be attributed to inadequate workshop facilities, limited practical exposure, among others. This was confirmed by Mkhwanazi and Mlambo (2024) who found lack of workshop facilities contributes to poor performance of students. Similarly, Pechetty and Tadesse (2022) established that institutional factors such as; lack of instructional machines, low supply of electrical power, among others result to more theoretical based learning that negatively affect the academic performance of students.

Additionally, instructors' related factors, such as limited professional development and teacher-centred instructional methods of teaching in Technical Colleges caused poor academic performance of students. This was in alignment with Mkhwanazi and Mlambo (2024) who found that lack of proper teaching methods among instructors contributes to poor academic performance of students. Nwaodo and Ogbonna (2019) established that metalwork at Technical College require good teaching skills and mastery of the subject matter by the instructors and they should focus on using problem solving methods which is more of students' centre teaching method to teach students to improve on their academic performance.

Also, inadequate guidance and counselling services causes poor academic performance of students, this was corroborated by Pechetty and Tedesse (2022) who found that lack of counselling of metalwork students causes less motivation on the subject, and at the same time causes poor reading habit, which eventually leads to poor academic performance of students.

Furthermore, the result of the hypothesis tested showed that there is a significant difference between the academic performance of male and female students, with the male students performing better. This outcome of this suggests that gender plays a better in influencing students' academic performance levels particularly in Technical subject such metalwork. This finding corroborates the report of Okoye and Odo (2020) who observed that male students often surpass their female counterparts in technical disciplines, a trend attributed to higher levels of interest, enhanced self-efficacy and societal support that favours male participation in technical oriented courses. In a similar vein, Umunadi (2011) noted that the predominance of male students in

practically oriented subjects is largely linked to cultural norms that associate technical skills with masculinity. Conversely, Aina and Olanipekun (2015) argued that with equal opportunities and supportive environment, females' students can match or exceed males' performance; this implies that teachers' attitudes and resource availability influence gender gaps in academic performance. Therefore, if these trends continue, metalwork graduates may be inadequately equipped to succeed in the job market, thereby compromising the goals of TVET in Nigeria.

### Conclusion and Recommendations

This study assessed the level of academic performance of students in metalwork technology in Technical Colleges in South-South Nigeria. Finding from the study indicated that students exhibited a low level of academic performance, and there is a significant different between male and female students. The contributing factors to these findings may include; inadequate workshop facilities, lack of qualified and experienced instructors, lack of students-centred teaching methods, and lack of guidance and counselling on the students. These situations poses a great threat to the development of competent and skilled mechanical craftsmen for the industrial sector of this nation and also discourage females from fully involved in mechanical craft. Therefore, urgent intervention is needed through the improve funding to provide workshop facilities for Technical; Colleges, professional development of technical instructors and improvement on guidance and counselling of metalwork students.

Based on the findings of this study, the following recommendations are made to improve the academic performance of students in metalwork technology:

1. Government and educational stakeholders should equip Technical Colleges workshop with metalwork facilities such as; instructional machines, tools and consumable materials to strengthens adequate practical experience of students.
2. Qualified technical instructors should be recruited and provided with regular professional development programme on current teaching methodologies to improve the academic performance of students.
3. Guidance and counselling services should be improved upon to ensure that their services enable male and female students to be motivated, develop independent reading habits and show more interest on the trade.

### References

- Aina, J. K., & Olanipekun, S. S. (2015). Gender analysis of students' academic performance in physics in Colleges of Education in Nigeria. *Journal of Education and Practice*, 6(3), 1-5.
- Anyiekan, U. R. (2019). Development and validation of practical tasks assessment instrument in basic electronics for quality assurance of senior secondary school learners. *Industrial Education Journal*, 1(1), 183-195.
- Aremu, A. O. (2001). Effects of motivation and self-regulatory strategies on academic performance of primary school pupil in Ibadan. *Unpublished Ph.D thesis. University of Ibadan, Nigeria.*
- Ayoubi, R. M., Solwa, B., Ayoubi, M. T., & Crawford, M. (2025). bridging the gap: academic performance and experience of technical college students in top-up University degree programme. *Cogent Education*, 12(1), 15-28.
- Benimpuye, A. E., Agbudu, A. P., & Idoko, I. L. (2020). Students' variables and their academic achievement in technical colleges in mathematics in Ogoja education zone, Cross-River

- State. *Multidisciplinary Journal of Research and Development Perspective*, 23159936, 28-36.
- Curtis, D. D. (2010). Teaching, learning and assessment. *Paper presented at the South-East Asian ministries of Education organisation. VOCTEH Conference Exploring Best VET Policies and Practices through Research and Networking Initiative: Brunei Darussalam, 23<sup>rd</sup> June.*
- Davis, B. & Francis, K. (2021). *Discusses of learning in education: Making scene of a landscape of difference frent.* A & M University
- Hornby, A. S. (2010). *Oxford advanced learners dictionary (8<sup>th</sup> ed).* Oxford University press.
- Imandojemu, O. (2008). Designing instrument for measuring students introductory LISP programming. *Journal of Educational Computing Research*, 1(1), 157-172.
- Mkhwanazi, M. S., & Mlambo, P. B. (2024). Investigating factors contributing to poor performance in teaching and learning of N3 assembly drawing: A case of Umgungundlove TVET College. *Journal Penelitan*, 8(1), 102-121.
- National Board for Technical Education (2004). *National mode specification in general metalwork.* NBTE press.
- National Business and Technical Examination Board (2011). *Chief examiners report for general metalwork 191-1* (Unpublished).
- Nwaodo, S. I., & Ogbonna, G. N. (2019). Relative effectiveness of reda and rubuilt problem solving models on metalwork students' academic achievement, interest and retention in technical colleges in Enugu State, Nigeria. *Industrial Education Journal*, 1(1), 71-79.
- Okoye, F. O., & Odo, I. J. (2020). Gender disparity and students' academic achievement in vocational education. *International Journal of Vocational Education Research*, 6(7), 45-53.
- Olufemi, O. T., Adediran, A. A., & Oyediran, W. O. (2018). Factors affecting students' academic performance in Colleges of Education in South-West Nigeria. *British Journal of Education*, 6(10), 43-56.
- Omeje, H. S., Alagba, A., & Uchechukwu, D. (2019). Assessment of facilities for improving instructional delivery of blocklaying and concreting programme in technical colleges in Ebonyi State. *Industrial Education Journal*, 1(1), 211-218.
- Pechetty, S. V. R., & Tadesse, T. (2022). Factors that associated with students' academic performance in TVET: The case of Boditi Industrial and Construction College. *International Journal of Scientific Development and Research*, 7(10), 870-881.
- Rusol, A. A., Chithira, J., Rizwan, G. C., Abdel-Salam, G. A., Khalifa, A., Ahmed, B., & Romanowski, J. (2023). Determinants of poor academic performance among undergraduate students: A systematic literature review. *International Journal of Educational Research open*, 1(1), 2-13.
- Steinmaye, R., Meibner, A., Weidinger, A. F., & Wirthwein, L. (2015). Academic achievement. In: L. S. Libon, U. Muller, & R. M. (Eds) *Oxford Bibliographics in Psychology*. Oxford University press.
- Sunaina, S. (2023). *What is descriptive research? Definition, methods, types and examples.* Retrieved from [www.research.life/blog/article/what-is-descriptive-research-definition-methods-type-and-examples/](http://www.research.life/blog/article/what-is-descriptive-research-definition-methods-type-and-examples/)
- Umunadi, E. K. (2011). Perception of technical education students on the role of ICT in teaching and learning. *International Journal of Academic Research in Business and Social Sciences*, 1(3), 1-12.
- Widodo, A. S., & Astuti, B. (2024). Critical analysis of social cognitive learning theory and its implementation in elementary schools in Mandalia. *Journal of Social Science*, 2(1), 6-12.