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Maintenance Funding Adequacy and Students' Competence in Workshop and Studio Practices in Higher Institutions in Rivers State: Implications For Sustainable Development Goal 4 (Quality Education)

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Abstract-This study examined the relationship between maintenance funding adequacy and students' competence in workshop and studio practices in higher institutions in Rivers State, Nigeria, with implications for Sustainable Development Goal 4 (Quality Education). The study adopted a correlational research design. The population comprised 1,002 workshop and studio instructors, technicians, and technologists in four selected higher institutions in Rivers State. A sample of 286 respondents was selected using proportionate stratified sampling. Data were collected using a structured questionnaire titled Maintenance Funding Adequacy and Students' Competence in Workshop and Studio Practices Questionnaire (MFASCWSPQ). The instrument was validated by experts in technical and vocational education, educational measurement and evaluation, and research methodology. A reliability coefficient of 0.70 was established using Cronbach's alpha. The research questions and hypotheses were analysed using Pearson's Product-Moment Correlation Coefficient with the aid of SPSS version 23 at the 0.05 level of significance. The findings revealed a weak positive and statistically significant relationship between the adequacy of maintenance funding and students' practical competence. The study also found a positive and statistically significant relationship between the promptness of the release of maintenance funds and students' practical competence. Consequently, both null hypotheses were rejected. It recommended that higher institutions should make realistic annual allocations for routine and preventive maintenance and establish predictable schedules for releasing maintenance funds. These measures could improve practical-learning conditions and contribute to the attainment of SDG 4, particularly in promoting relevant skills and providing safe, effective educational facilities.

Keywords: Maintenance Funding Adequacy, Students' Practical Competence, Workshop Practices, Studio Practices, Higher Institutions, Sustainable Development Goal 4.

I. Introduction

Education is widely recognised as the single most powerful instrument through which nations build human capital, reduce poverty, and sustain economic growth (Federal Republic of Nigeria, 2013). In recognition of this role, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development in 2015, and within it Sustainable Development Goal 4 (SDG 4) commits member states to ensure inclusive and equitable quality education and to promote lifelong learning opportunities for all (United Nations, 2015). The goal is not limited to increasing enrolment. Its targets stress learning outcomes, relevant skills, and the quality of the learning environment. Target 4.3 calls for equal access to affordable and quality technical, vocational and tertiary education; Target 4.4 seeks to substantially increase the number of youths and adults who possess relevant technical and vocational skills for employment, decent jobs and entrepreneurship; and

Target 4.a requires countries to build and upgrade education facilities that are safe, effective and conducive to learning (UNESCO, 2017).

Since the adoption of the goal, successive monitoring reports have shown that many developing countries, particularly in sub-Saharan Africa, are lagging behind on indicators of quality, relevance and learning conditions (UNESCO, 2023; Ayoko et al., 2023). The reports consistently identify inadequate funding, deteriorating infrastructure, and a shortage of functional learning resources as major obstacles. These concerns are particularly acute in tertiary education, where programmes in engineering, technology, vocational and technical education, and the creative and applied arts depend heavily on laboratories, workshops and studios in order to produce graduates who can actually do what their certificates say they can do (Bwala, 2020). Quality, in this sense, cannot be assured by lecture halls and textbooks alone; it must be demonstrated in the observable competence of graduates.

Competence refers to the integrated possession of knowledge, practical skills, attitudes, and the capacity to apply them effectively in real work situations (UNESCO, 2015; Cedefop, 2014). In technical and vocational education and training (TVET) and in studio-based disciplines such as fine and applied arts, industrial design, architecture, fashion, and ceramics, competence is acquired through guided practice and the application of theoretical knowledge to practical tasks. Students learn to operate machines, handle tools, work with materials, interpret technical drawings, observe safety procedures, and produce finished artefacts or systems. These capabilities are developed through repeated hands-on engagement, supervised demonstration, and corrective feedback, consistent with experiential learning theory (Kolb, 1984) and competency-based approaches to vocational education and training (International Labour Organization [ILO], 2020).

The labour-market value of such competence is considerable. Employers, professional regulators, and industry bodies increasingly judge graduates by their workplace readiness rather than by their academic grades alone (Organisation for Economic Co-operation and Development, 2024). Studies in several African countries report persistent complaints that graduates of technical and vocational programmes lack the practical proficiency demanded by industry, and that employers are compelled to retrain new recruits at additional cost (Kennedy, 2011). Such a skills mismatch undermines graduate employability and entrepreneurship, which are central to Target 4.4. It also weakens the contribution of higher education to industrial development, and it places a premium on understanding the conditions under which practical competence is, or is not, being built in higher institutions.

Workshops and studios are the physical and pedagogical heart of practice-based education. A workshop is a purpose-equipped space in which students work with machines, hand tools, power tools, measuring instruments and materials in fields such as woodwork, metalwork, automobile technology, building and construction, electrical and electronic technology, and agricultural engineering. A studio, in turn, is a creative production space where students in the visual and applied arts, graphic design, textile and fashion design, and related fields conceive, experiment with and produce works using specialised equipment and consumables (Forest et al., 2014). In both settings, learning is situated: the quality of the environment directly shapes the quality of the experience and, consequently, the level of skill that students attain.

Research has repeatedly linked the availability, functionality and condition of workshop and studio facilities to students' practical achievement. Where machines are operational, tools are sufficient in number, power and ventilation are reliable, and consumables are available, students spend more time on task, receive more individual attention, and develop greater confidence and accuracy (Tuti, 2024; Eniekenemi & Tochi, 2021). Where facilities

are broken, obsolete, overcrowded or unsafe, instruction tends to retreat into theory, demonstrations replace hands-on practice, and students graduate with limited exposure to the equipment they will meet in industry (Chinonso, 2017). Learning in workshops and studios therefore depends not only on the existence of facilities but, more importantly, on their continuous maintenance in a state fit for instruction.

Maintenance may be understood as the combination of all technical and administrative actions intended to retain facilities and equipment in, or restore them to, a condition in which they can perform their required function (Sample, 2016). In educational institutions it includes routine servicing, preventive checks, repairs, replacement of worn parts, calibration of instruments, upgrading of obsolete equipment, replenishment of consumables, and the upkeep of buildings, utilities and safety installations. Maintenance is typically classified as preventive, corrective or emergency, and each category demands a predictable stream of financial resources, skilled technical personnel, spare parts and managerial attention (Okeke, 2013).

Funding adequacy refers to the extent to which the financial resources allocated for maintenance are sufficient, timely and appropriately utilised to meet the actual upkeep needs of facilities (Omole & Jonathan, 2024). Maintenance budgets are frequently the first casualty when institutions face financial constraints, because capital projects and personnel costs are given priority while upkeep is treated as deferrable (Lateef et al., 2010). The consequences of deferral are cumulative. Minor faults develop into major breakdowns, replacement costs far exceed what routine servicing would have required, and the useful life of costly equipment is shortened. International experience suggests that sustained underinvestment in maintenance is among the most common causes of the gap between the nominal and the effective capacity of educational infrastructure (Okeke, 2013).

The funding of maintenance in public higher institutions is closely tied to the broader financing of education. The Incheon Declaration and the Education 2030 Framework for Action recommend that countries allocate at least four to six percent of gross domestic product, or fifteen to twenty percent of total public expenditure, to education (UNESCO, 2015). Available evidence indicates that Nigeria's allocations have generally fallen below these benchmarks, and that capital and overhead releases to institutions are often irregular and inadequate for the upkeep of existing assets (Ayoko et al., 2023). Institutions have therefore relied on supplementary sources, including intervention funds, internally generated revenue, donor support, and industry partnerships, none of which is guaranteed to be sufficient or directed to workshop and studio maintenance.

Nigeria operates one of the largest higher education systems in Africa, comprising federal, state and private universities, polytechnics, monotechnics and colleges of education, which are regulated respectively by the National Universities Commission (NUC), the National Board for Technical Education (NBTE) and the National Commission for Colleges of Education (NCCE). These regulatory bodies prescribe minimum academic standards and accreditation requirements that explicitly address the adequacy of laboratories, workshops, studios, tools, and equipment for practice-based programmes. In Nigeria, the National Universities Commission (NUC) evaluates physical facilities as part of its programme accreditation process, while the National Board for Technical Education (NBTE) requires appropriate accommodation, functional equipment, tools, machines, and safety provisions for technical programmes. (NBTE, 2024). Empirical evidence from Rivers State reinforces the importance of these requirements. Dokubo et al. (2024) found inadequacies in workshop spaces, studios, tools, and equipment for training technical and vocational education teachers, while Enoche and Wordu (2025) reported that workshop facilities for electrical installation and maintenance training were generally inadequate and poorly maintained.

Similarly, a 2024 NUC accreditation report documented inadequate laboratory space, ill-equipped laboratories, and insufficient funding in an engineering programme, which received interim accreditation. These findings underscore the importance of adequate funding, regular maintenance, and functional practical facilities in sustaining educational quality and supporting students' competence development.

The Tertiary Education Trust Fund (TETFund), established by statute to provide supplementary funding for public tertiary institutions, has supported the construction, rehabilitation and equipping of many facilities across the country (Bwala, 2020). Nonetheless, TETFund interventions are project-based and are subject to eligibility rules, procurement cycles and disbursement delays, and they are not designed to substitute for the routine, recurrent funding required to keep facilities operational. Reports from several institutions describe workshops filled with obsolete or non-functional machines, studios lacking basic consumables, inadequate power supply, and unsafe working conditions, while enrolments have continued to rise (Bwala, 2020; Omole & Jonathan, 2024). Disruptions caused by industrial action in the tertiary sector, inflationary pressure on the cost of imported spare parts and equipment, and exchange-rate volatility have compounded the difficulty of sustaining adequate maintenance (Chinonso, 2017)).

Rivers State, located in the Niger Delta region of southern Nigeria and anchored by the industrial and commercial hub of Port Harcourt, hosts a significant concentration of higher institutions. These include the University of Port Harcourt, Rivers State University, Ignatius Ajuru University of Education, Captain Elechi Amadi Polytechnic, Kenule Beeson Saro-Wiwa Polytechnic, and a number of other public and private institutions offering programmes in engineering, technology, technical and vocational education, and fine and applied arts (Corazza, Mascio & Moretti, 2016). The state's economy, driven by the oil and gas industry and its service and fabrication sectors, creates substantial demand for graduates with strong practical competence in fields such as mechanical, electrical, marine, civil and production technologies, as well as in design, media and the creative industries (Montgomery, 2007).

This demand makes the condition of workshops and studios in Rivers State higher institutions a matter of regional as well as national concern. Where students are unable to gain adequate hands-on experience, graduates may struggle to compete for jobs in the local industrial environment, and employers may favour candidates trained elsewhere or engage in costly in-house retraining. The state also faces a high rate of youth unemployment and a pressing need to diversify the economy through entrepreneurship and skills-based enterprise (Jurgelevicius & Raisiene, 2025). Competence in workshop and studio practices is thus closely related to the ability of the state's higher institutions to contribute to local development and to the realisation of SDG 4 targets on skills, access and learning environments (Corazza, et al., 2016).

Against this background, it is important to ask whether the funds committed to the maintenance of workshop and studio facilities in Rivers State higher institutions are adequate and whether the level of that adequacy is reflected in the practical competence of students. Maintenance funding is an input to the educational process, while students' competence is an outcome of it. The systematic examination of the relationship between the two can reveal whether lapses in resourcing are translating into deficits in learning, and can guide policy on how scarce resources should be prioritised to advance quality education. It is this relationship that the present study sets out to investigate.

Three complementary perspectives help to explain why maintenance funding should matter for students' competence. Human capital theory holds that investment in education yields returns in the form of enhanced productivity and earnings, but it also implies that the quality

of the investment determines the size of the return (Lateef, Khamidi & Idrus, 2010). If the facilities through which skills are produced are poorly maintained, the human capital generated is of lower value, regardless of the number of graduates produced. The systems, or input–process–output, model of education treats funds, facilities and personnel as inputs that are transformed through teaching and learning processes into outputs such as skills, knowledge and attitudes (Okeke, 2013). Within this model, maintenance funding is an input that sustains the condition of facilities, and students' competence is an output that reflects how effectively the inputs were converted into learning.

Experiential learning theory, associated with the work of Kolb, emphasises that knowledge is created through the transformation of concrete experience (Sample, 2016). In workshops and studios, concrete experience is possible only when students can actually use functional tools, machines and materials. Where equipment is unavailable or unsafe, the experiential cycle of doing, reflecting, conceptualising and experimenting is interrupted, and competence development is correspondingly constrained. Additionally, these perspectives suggest a plausible causal chain in which adequate maintenance funding sustains functional facilities, functional facilities enable meaningful practice, and meaningful practice produces competent graduates. The chain also shows why shortfalls at the first link can weaken every subsequent one.

Scholars have long observed that Nigeria suffers from a weak maintenance culture, in which assets are acquired with enthusiasm but are neglected once commissioned (Ayoko et al., 2023). In educational institutions this tendency is reflected in the absence of written maintenance policies, the lack of asset registers and equipment inventories, the limited use of preventive maintenance schedules, and the reliance on emergency repairs after breakdowns have already disrupted teaching. Maintenance units are often understaffed and poorly resourced, and technologists and technicians in workshops and studios may lack the training or authority to carry out even routine servicing (Tuti, 2024).

Procurement rules, bureaucratic approval chains and delays in the release of funds further reduce responsiveness. A small repair that might cost a modest sum can remain outstanding for months while approvals are sought, during which students are deprived of practice time (Dokubo, et al., 2024). The unreliability of public electricity supply adds another layer of cost, since institutions must fund generators and fuel simply to run machines, and sudden power surges damage sensitive equipment (Enoche, & Wordu, 2025). Insecurity, vandalism and theft of tools also drain resources. These conditions mean that the adequacy of maintenance funding cannot be judged only by the nominal size of a budget line; it must also be judged by whether the funds are enough, timely and well used in relation to the real needs of the workshop and studio environment, which is why funding adequacy is treated in this study as a multi-dimensional construct.

Safety and inclusion deserve particular mention. Workshops handle heavy machinery, electrical installations, welding operations, solvents and dust, and studios handle chemicals, kilns, dyes and sharp instruments. Poorly maintained facilities increase the probability of accidents and discourage the participation of students who feel unsafe, including, in many contexts, female students and students with disabilities (Corazza et al., 2016). A learning environment that is unsafe or inaccessible is inconsistent with the commitment in Target 4.a to provide safe, inclusive and effective learning environments for all, and with Target 4.5 on equity in access to vocational training (UNESCO, 2017). Maintenance is thus not only a technical matter but also an issue of equity and the protection of students' wellbeing.

1. Statement Of The Problem

Higher institutions are expected to equip students with the practical competence required to function effectively in industry, to start and manage enterprises, and to contribute to national

development. Meeting this expectation depends on workshops and studios that are functional, safe and adequately equipped. Yet a growing body of evidence suggests that many such facilities in Nigerian higher institutions are in a state of disrepair. Machines lie idle for want of minor repairs, studios operate without sufficient consumables and basic infrastructure, safety installations are absent or defective, and students are frequently trained on equipment that is outdated or insufficient in number relative to class size (Chinonso, 2017; Bwala, 2020; Omole & Jonathan, 2024). These conditions are visible in Rivers State, where observations and institutional reports indicate that many workshops and studios in public higher institutions face similar challenges (Eniekenemi & Tochi, 2021).

One plausible explanation is the inadequacy of funds allocated to maintenance. Public institutions in the state depend largely on subventions from government, supplemented by intervention funds and limited internally generated revenue. These sources are generally earmarked for salaries, new construction and other priorities, leaving little for the routine and preventive maintenance of workshops and studios (Ayoko et al., 2023). Where maintenance funds exist, delays in release, inconsistent budgeting, weak maintenance planning, and procurement bottlenecks may reduce their effectiveness (Lateef et al., 2010). The persistence of these conditions raises the concern that students are being trained in environments that cannot support the development of the practical skills their programmes promise.

The consequences of such a situation are serious. Insufficient access to functional equipment limits the time students spend in practice, reduces the quality of supervision and feedback, increases exposure to hazards, and encourages a shift from hands-on instruction to theoretical delivery (Tuti, 2024; Chinonso, 2017). Graduates produced under these conditions are likely to enter the labour market with weak practical proficiency, contributing to unemployment and underemployment, to employers' dissatisfaction with the standard of tertiary education, and to a continued reliance on foreign or externally trained technical personnel. At the institutional level, deficient facilities also threaten programme accreditation, institutional reputation, and the capacity to attract students, partners and research grants.

These outcomes bear directly on Sustainable Development Goal 4. Targets 4.3 and 4.4 cannot be met if tertiary and vocational programmes fail to produce graduates with relevant technical and vocational skills, and Target 4.a cannot be met if learning facilities are not maintained in a safe and effective condition. Should Rivers State higher institutions continue to operate with inadequately maintained workshops and studios, progress toward quality education in the state, and by extension in Nigeria, will be undermined (UNESCO, 2023). The problem is therefore not simply one of infrastructure; it is a problem of educational quality, graduate employability and sustainable development.

The problem is compounded by the scale and pace of change in the technologies that students are expected to master. Modern industry increasingly relies on computer-controlled machines, digital design and fabrication tools, advanced electrical and electronic systems, and contemporary media technologies. Workshops and studios that cannot sustain even basic equipment are unlikely to be able to adopt or maintain these newer technologies, so the distance between what students practise and what employers use continues to widen. Over time, the neglect of maintenance therefore carries a compounding cost: it limits present learning and also prevents institutions from keeping pace with the evolving demands of the workplace.

It is also unclear whether students in different programmes and institution types are affected equally. Universities, polytechnics and colleges of education operate under different funding arrangements and regulatory expectations, and programmes differ in their

dependence on heavy machinery, consumables and specialised space. Practice-intensive programmes, such as those in engineering, technical education and the applied arts, may face the most severe consequences from inadequate maintenance funding, yet the available literature offers little comparative evidence on where the shortfalls are greatest or how they relate to students' measured competence. Without such disaggregated evidence, it is difficult for policymakers and institutional managers to target scarce resources where they will have the greatest effect on learning.

Although the literature on facilities management and technical education in Nigeria is growing, several gaps remain. First, many existing studies focus on the availability or provision of facilities rather than on the adequacy of the funds devoted to maintaining them (Bwala, 2020; Tuti, 2024). Second, studies that address maintenance rarely establish an empirical link between funding adequacy and measurable indicators of students' practical competence; instead they tend to rely on general assessments of facility condition or on the perceptions of administrators (Lateef et al., 2010). Third, workshops and studios are often examined separately or lumped together with laboratories and classrooms, which obscures the particular demands of these practice-intensive spaces (Okeke, 2013). Fourth, there is limited research situated in Rivers State, whose industrial profile and institutional mix make it a distinctive and strategically important setting (Eniekenemi & Tochi, 2021). Finally, few studies explicitly interpret their findings in relation to the targets of SDG 4, leaving policymakers without a clear framework for connecting maintenance financing to global education commitments.

There is therefore a need for empirical evidence on the extent to which maintenance funding for workshops and studios in Rivers State higher institutions is adequate, the level of competence students demonstrate in workshop and studio practices, and the relationship between the two. Without such evidence, decisions about budgeting, intervention priorities and institutional planning are likely to continue to rest on assumptions rather than data. This study is designed to address the problem by examining maintenance funding adequacy and students' competence in workshop and studio practices in higher institutions in Rivers State, and by drawing out the implications of the findings for the attainment of Sustainable Development Goal 4 (Quality Education).

However, the problem addressed by this study is the uncertainty surrounding whether maintenance funding for workshops and studios in Rivers State higher institutions is adequate, and whether any inadequacy is reflected in students' competence in workshop and studio practices, with consequences for the quality of education envisioned in SDG 4. The absence of reliable, locally grounded evidence on this question leaves institutional managers, regulators and funding agencies without the information needed to justify, prioritise and defend investments in maintenance. Addressing this gap is essential if higher institutions in the state are to produce graduates who are practically competent, employable and capable of contributing to sustainable development.

1.Purpose of the Study

The purpose of this study is to examine the relationship between maintenance funding adequacy and students' practical competence in workshop and studio practices in higher institutions in Rivers State: Specifically, the study sought to determine

- Examines the relationship between the adequacy of maintenance funding and students' practical competence in workshop and studio practices in higher institutions in Rivers State.

- Examines the relationship between the prompt release of maintenance funds and students' practical competence in workshop and studio practices in higher institutions in Rivers State:

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2.Research Questions
The following research questions were structured to guide the study:

1. What is the relationship between the adequacy of financial resources allocated for the routine maintenance and repair of workshop and studio facilities and students' practical competence in workshop and studio practices in higher institutions in Rivers State?
2. What is the relationship between the promptness of release maintenance funds and students' practical competence in workshop and studio practices in higher institutions in Rivers State?

3. Hypotheses
The following null hypotheses were formulated and tested at the 0.05 level of significance:
H_{01}: There is no significant relationship between the adequacy of financial resources allocated for the routine maintenance and repair of workshop and studio facilities and students' practical competence in workshop and studio practices in higher institutions in Rivers State.
H_{02}: There is no significant relationship between the promptness of the release of maintenance funds and students' practical competence in workshop and studio practices in higher institutions in Rivers State

4. Funding, Infrastructure And The Quality Of Higher Education In Nigeria
Ayoko, Peter and Jegede (2023) examined the causes and effects of inadequate infrastructural facilities in public universities in Nigeria, using qualitative and quantitative data. They identified poor funding, corruption, project abandonment, a poor maintenance culture, weak planning and low internally generated revenue as the main factors behind the inadequacy. The effects they reported included poor quality of teaching and learning, strike actions, brain drain and weak research output. The authors recommended that government raise funding for public universities toward the UNESCO benchmark and adopt public–private partnerships in the provision of facilities. The study is important to the present work because it links funding shortfalls and weak maintenance culture directly to the quality of learning. However, it treats infrastructure in general and does not isolate workshops and studios or measure students' practical competence.

Chinonso (2017) studied the management of woodwork workshops in four Nigerian tertiary institutions. The study found that most of the institutions still operated with obsolete equipment and that teachers were seldom exposed to training or retraining that would update their knowledge. The author linked the poor management of these workshops to graduates who had little practical knowledge of the trade and recommended periodic government review of woodwork technology programmes. Bwala (2020) similarly assessed the facilities available for teaching and learning metalwork technology in colleges of education in the North-Eastern states of Nigeria, focusing on the availability and use of the facilities required by the programme. Omole and Jonathan (2024) turned attention to the management, maintenance and adequacy of resources for the efficiency of woodwork workshops in technical colleges of education in Nigeria, which brings maintenance explicitly into the discussion of workshop effectiveness.

Eniekenemi and Tochi (2021) investigated the role of quality workshops in enhancing students' practical competences in technical colleges in Rivers State. Their work supports the premise that the condition of the workshop is related to the competence students acquire, although it concerns technical colleges rather than higher institutions and does not examine the funding of maintenance. Outside Nigeria, Tuti (2024) studied the effective utilisation of workshop facilities for skills acquisition in public technical and vocational education and training institutions in Nairobi County, Kenya. The study reinforces the view, reported in the Nigerian studies above, that the presence, condition and use of workshop facilities shape the skills that trainees acquire.

Lateef, Khamidi and Idrus (2010) presented a case study of building maintenance management on a Malaysian university campus. Although the setting is a different country and the facilities studied are buildings rather than instructional workshops, the study is relevant because it treats maintenance as a managed function of the university that depends on planning, resources and organisation. Okeke (2013) discussed the management of facilities in the classroom, underscoring that educational facilities require deliberate management if they are to support teaching and learning. Sample (2016) approaches maintenance from an architectural perspective, presenting it as a continuing activity that sustains the built environment, not as an afterthought to construction. Corazza, Di Mascio and Moretti (2016), in a case study of pavement maintenance, showed how maintenance management can be organised to improve the safety of users. Taken together, these works support the position adopted in this study that maintenance is a continuing, resource-dependent activity with consequences for safety and functionality. None of them, however, relates maintenance funding to students' learning outcomes.

Forest et al. (2014) described the Invention Studio, a university maker space and its culture, as an example of a practice-based learning environment in higher education where students design and build using shared equipment. Chang and Huang (2022) examined stakeholder workshops as a pedagogical method for experiential learning in collaborative planning education; although the workshops in that study are learning events rather than physical facilities, the study supports the experiential-learning logic on which the present study relies, namely that students develop competence through active, guided practice. Montgomery (2007) reviewed best practice in creative industry business incubators and managed workspaces, which illustrates the importance of well-equipped and well-managed workspaces to creative production. Jurgelevicius and Raisiene (2025) reported start-up founders' perspectives on the critical factors for student start-up success in university entrepreneurial ecosystems, which points to the value of university environments in enabling graduates to enter enterprise. These studies are not about maintenance funding, but they indicate why functional studios and workshops matter for the entrepreneurial and creative outcomes that SDG 4 anticipates. The reviewed studies show, first, that Nigerian higher institutions face persistent funding and infrastructure deficits (Ayoko et al., 2023); second, that workshop facilities in technical and vocational programmes are frequently obsolete, inadequate or poorly managed (Bwala, 2020; Chinonso, 2017; Omole & Jonathan, 2024); third, that the quality of workshops is associated with the practical competence of students (Eniekenemi & Tochi, 2021; Tuti, 2024); and fourth, that maintenance is a managed, resource-dependent activity (Lateef et al., 2010; Sample, 2016). Several gaps remain as most of the Nigerian studies concentrate on the availability, management or utilisation of facilities, or on a single trade such as woodwork or metalwork, and not on the adequacy and timeliness of the funds committed to maintenance. The one study situated in Rivers State (Eniekenemi & Tochi, 2021) is set in technical colleges and not in universities and polytechnics. Studio-based programmes receive little attention in the Nigerian literature reviewed, and none of the studies explicitly relates maintenance funding to students' competence or interprets the findings against SDG 4. The present study addresses these gaps by examining the relationship between the adequacy and promptness of release of

maintenance funds and students' practical competence in workshops and studios in higher institutions in Rivers State.

II. Methodology

The study adopted a correlational research design. A correlational research design is appropriate because the study seeks to determine the relationship between maintenance funding adequacy and students' competence in workshop and studio practices in higher institutions in Rivers State (Nwankwo, 2016). The design enables the researchers to establish the direction and strength of the relationships between the independent variables and the dependent variable without manipulating any of the variables. The population of the study comprises 1,002 workshop and studio instructors, technicians, and technologists in four selected higher institutions in Rivers State, Nigeria. The institutions are Rivers State University (RSU), Ignatius Ajuru University of Education (IAUE), Kenule Beeson Saro-Wiwa Polytechnic (KENPoly), and Captain Elechi Amadi Polytechnic (CEAPOLY).

Table 1: Distribution of the Population by Institution

S/N	Institution	Population	Percentage (%)
1	Rivers State University (RSU)	350	34.93
2	Ignatius Ajuru University of Education (IAUE)	280	27.94
3	Kenule Beeson Saro-Wiwa Polytechnic (KENPoly)	210	20.96
4	Captain Elechi Amadi Polytechnic (CEAPOLY)	162	16.17
	Total	1,002	100.00

The sample for the study consist of 286 respondents drawn from a population of 1,002 workshop and studio instructors, technicians, and technologists in the four selected higher institutions in Rivers State. A proportionate stratified sampling technique was adopted to ensure that each institution is represented according to its population size. A structured questionnaire developed by the researchers titled *Maintenance Funding Adequacy and Students' Competence in Workshop and Studio Practices Questionnaire (MFASCWSPQ)*. The questionnaire designed using a modified four-point Likert rating scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD), weighted 4, 3, 2, and 1, respectively. Copies of the questionnaire were presented to experts in technical and vocational education, educational measurement and evaluation, and research methodology. The experts examine the questionnaire items in terms of clarity, relevance, adequacy, and consistency with the research questions and objectives. The reliability index of 0.70 established using Cronbach's alpha. Pearson's Product-Moment Correlation Coefficient (PPMCC) was used to test the research questions and hypotheses with the aid of SPSS version 23

III. Results

1. What is the relationship between the adequacy of financial resources allocated for the routine maintenance and repair of workshop and studio facilities and students' practical competence in workshop and studio practices in higher institutions in Rivers State?
2. What is the relationship between the promptness of release maintenance funds and students' practical competence in workshop and studio practices in higher institutions in Rivers State?

1. Hypotheses

The following null hypotheses were formulated and tested at the 0.05 level of significance:

H_{01}: There is no significant relationship between the adequacy of financial resources allocated for the routine maintenance and repair of workshop and studio facilities and students' practical competence in workshop and studio practices in higher institutions in Rivers State.

H_{02}: There is no significant relationship between the promptness of the release of maintenance funds and students' practical competence in workshop and studio practices in higher institutions in Rivers State

Table 1: Pearson correlation between adequacy of financial resources and students' practical competence.

		adequacy	competence
adequacy	Pearson Correlation	1	.291**
adequacy	Sig. (2-tailed)		.000
adequacy	N	286	286
competence	Pearson Correlation	.291**	1
competence	Sig. (2-tailed)	.000	
competence	N	286	286
**. Correlation is significant at the 0.05 level (2-tailed).	**. Correlation is significant at the 0.05 level (2-tailed).	**. Correlation is significant at the 0.05 level (2-tailed).	**. Correlation is significant at the 0.05 level (2-tailed).

Table 1 shows a Pearson correlation coefficient of (r = 0.291\), with a significance value of (p < 0.001\) and a sample size of 286 respondents. This indicates a weak positive relationship between the adequacy of financial resources allocated for routine maintenance and repair of workshop and studio facilities and students' practical competence. Therefore, this positive relationship implies that higher adequacy of financial resources tends to be associated with higher levels of students' practical competence. However, the relationship is relatively weak, suggesting that other factors may also contribute to students' competence in workshop and studio practices.Since the significance value is less than the 0.05 level of significance, the null hypothesis is rejected. Therefore, there is a statistically significant, weak positive relationship between the adequacy of financial resources allocated for routine maintenance and repair of workshop and studio facilities and students' practical competence in higher institutions in Rivers State.

Table 2: Pearson correlation between promptness of release of maintenance funds and students' practical competence.

		promptness	competence
promptness	Pearson Correlation	1	.350**
promptness	Sig. (2-tailed)		.000
promptness	N	286	286
competence	Pearson Correlation	.350**	1
competence	Sig. (2-tailed)	.000	
competence	N	286	286
**. Correlation is significant at the 0.05 level (2-tailed).	**. Correlation is significant at the 0.05 level (2-tailed).	**. Correlation is significant at the 0.05 level (2-tailed).	**. Correlation is significant at the 0.05 level (2-tailed).

Table 2 reveals a Pearson correlation coefficient of (r = 0.350), with a significance value of (p < 0.001) and a sample size of 286 respondents. This indicates a positive relationship

between the promptness of the release of maintenance funds and students' practical competence in workshop and studio practices. The finding implies that more prompt release of maintenance funds tends to be associated with higher levels of students' practical competence. Timely availability of funds may help institutions carry out necessary repairs and maintenance, thereby supporting the availability and usability of workshop and studio facilities for practical learning.

Since the significance value is less than the 0.05 level of significance, the null hypothesis is rejected. Therefore, there is a statistically significant positive relationship between the promptness of the release of maintenance funds and students' practical competence in workshop and studio practices in higher institutions in Rivers State.

IV. Discussion Of Findings

The first finding revealed a weak positive and statistically significant relationship between the adequacy of financial resources allocated for routine maintenance and repair of workshop and studio facilities and students' practical competence in higher institutions in Rivers State ($r = 0.291$, $p < 0.001$, $N = 286$). Since the probability value was below the 0.05 level of significance, the first null hypothesis was rejected. This means that greater adequacy of maintenance funding was associated with higher levels of students' practical competence, although the strength of the relationship was weak.

The finding suggests that adequate funding can help institutions repair faulty equipment, service machines, replace worn-out parts, maintain safety installations and provide materials needed for practical instruction. When facilities are functional, students have more opportunities to practise, develop accuracy and apply theoretical knowledge to practical tasks. This finding is consistent with the literature reviewed in the study. Ayoko, Peter and Jegede (2023) linked inadequate infrastructure and poor maintenance culture in Nigerian public universities with problems affecting teaching and learning. Chinonso (2017) reported that obsolete workshop equipment in Nigerian tertiary institutions constrained the practical knowledge students acquired. Similarly, Eniekenemi and Tochi (2021) emphasised the role of quality workshops in enhancing students' practical competence in technical colleges in Rivers State. Tuti (2024) also highlighted the importance of the condition and utilisation of workshop facilities for skills acquisition. Although these studies did not test precisely the same funding–competence relationship, they support the interpretation that resources and functional practical-learning environments matter for skills development.

The second finding showed a positive and statistically significant relationship between the promptness of release of maintenance funds and students' practical competence ($r = 0.350$, $p < 0.001$, $N = 286$). The correlation was higher than that observed for the adequacy of funds, although it remained modest in strength. Since p was below 0.05, the second null hypothesis was rejected. The result indicates that more prompt release of maintenance funds was associated with higher levels of practical competence among students in the institutions studied. This finding is in line with the maintenance-management perspective presented in the reviewed literature. Lateef, Khamidi and Idrus (2010) treated maintenance as a planned institutional function requiring resources and organisation, while Sample (2016) described maintenance as an ongoing activity rather than an afterthought.

V. Conclusion

Based on the findings, the study therefore concludes that sustained and well-managed maintenance financing should be treated as an important component of quality education in Rivers State higher institutions. Improving maintenance funding processes may contribute

to better practical-learning conditions and support the objectives of SDG 4, particularly the development of relevant skills and the provision of safe, effective educational facilities. Since the study is correlational, the findings establish significant relationships and should not be taken as definitive evidence of cause and effect.

1. Recommendations

.**The following recommendations were proffered:**

- Higher Institutional management should make realistic annual allocations for routine and preventive maintenance of workshops and studios, based on documented facility conditions, equipment inventories and programme requirements.

- The authorities responsible for releasing maintenance funds should establish predictable disbursement schedules and reduce avoidable administrative delays. Approved funds should reach institutions early enough to support repairs and servicing before or during the periods when facilities are needed for instruction.

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