



The Role of Mechanical Technology Education in Curbing Cybercrime Among Youths in Rivers State, Nigeria

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Abstract

This study examined the role of Mechanical Technology Education in curbing cybercrime among youths in Rivers State, Nigeria, with an emphasis on welding/fabrication and fittings. A descriptive survey design was adopted. The population comprised 28 Mechanical Technology Education lecturers and instructors from Ignatius Ajuru University of Education and Rivers State University, Port Harcourt. Data were collected using a structured questionnaire based on a five-point Likert scale. The instrument yielded a reliability coefficient of 0.87, calculated using the Pearson Product Moment Correlation method. Means and standard deviations were used to answer the research questions, while a t-test was employed to test the hypotheses at the 0.05 level of significance. Findings revealed that welding/fabrication contributes significantly to reducing cybercrime through skill acquisition, self-employment, and innovation, while fittings contribute moderately through the promotion of technical competence and industrial productivity. The study further revealed no significant difference between the mean responses of lecturers and instructors. The study concluded that Mechanical Technology Education is an effective tool for youth empowerment and cybercrime reduction. It recommended integrating ICT skills into the curriculum and strengthening government-industry partnerships to enhance youth employment opportunities.

Keywords: Technical Education, Mechanical Technology Education, Cybercrime, Youth Empowerment.

Introduction

However, technical education places an emphasis on "applied science and modern technology" and teaches students the "hands-on" skills and information needed for a particular job or trade. As described by Olowe (2023), technical education is a secondary school programme that aims to educate pupils in a variety of trades and occupations, including more conventional ones such as teaching, secretarial work, agro-veterinary medicine, and nursing. Therefore, careers in technical fields, which are above skilled trades but below professional fields like engineering and science, are best suited to graduates of technical schools. Becoming a technician in fields such as healthcare, computer science, or automotive repair is one example. In response to a demand for technicians and in an effort to improve the standard of vocational training, particularly for underserved populations, technical education was established. Colleges and other post-secondary institutions often provide this kind of education because of its significance to economic growth. This is why, according to Olowe (2023), students enrolled in Technical Education programmes may choose from a wide variety of specialities designed to help them secure good jobs. The main areas of focus in the offered options include woodworking, metalworking, construction, electrical engineering, electronics, appliance repair, car service, aircraft maintenance, business machine maintenance, and a host of other construction and maintenance fields such as carpentry, electricity, masonry, plumbing and pipe fitting, drafting, electronics occupation, and refrigeration. Technical schools provide a variety of programmes, including agricultural education, building technology, business education, electrical and electronics technology, hospitality and hotel management, mechanical technology, and more (Adamu et al., 2025), which lend credence to Olowe's claim.

As a Subsystem of Technical Education Programs, Mechanical Technology Education: A subset of technical education programmes, mechanical technology education seeks to equip students with competence in mechanical systems. According to Uka and Ochogba (2019), mechanical technology education includes metalwork and automotive technology courses. They further note that automotive technology education is a university course of study that aims to produce graduates capable of working as mechanics or assembly line workers in the automotive industry. The objective is to educate people who can, among other things, identify problems, fix them, spray them, fix engines, work on electrical and electronic systems, vulcanise tyres, and sell car parts. Students who pursue education in automotive technology are expected to engage in successful self-employment after graduation because they have gone through formal institutions where they have gained better-coordinated knowledge and abilities needed on the job (Onwusa et al., 2021). Conversely, according to Ugbe in Ajie et al. (2022), metalwork technology education programmes are designed to provide students with marketable skills that may be used for both self-sufficiency and paid employment. Among the many topics covered in this subfield of mechanical technology are foundry procedures, fabrication, welding, forging, machine shop operations, and equipment maintenance duties. As a result, at certain schools, students majoring in automotive technology and those majoring in metalworking technology are organised into separate departments. That said, the researchers noted that there are certain schools where mechanical technology is taught alongside automotive repair and metalwork manufacturing, rather than separately. Theoretical subjects covered in mechanical technology include machine shop practice, construction methods, electrical circuits, and graphics (Nwankwo & Ogan, 2025). Related practical skills include foundry, forging, machining, welding, fabrication, and fittings.

Welding and fabrication, as engineering skills taught at technical institutes, focus on shaping and joining metals to create practical items and buildings. It is a skill within mechanical engineering that can help individuals take advantage of business opportunities presented by technical colleges. Welding and fabrication involve using heat and pressure to combine metals—with or without filler materials (American Welding Society, 2013). Training programmes in welding and fabrication aim to produce workers who are well-versed in the tools, materials, procedures, and safety protocols needed to complete metalwork tasks safely and effectively. A person with welding and fabrication skills may use their hands and minds to create metal structures according to engineering drawings. People who work in this field often have expertise in pressure-related construction or structural fabrication (Idibia et al., 2022). According to Overtom, as mentioned in Aikhionbare (2016), it also helps people gain practical knowledge that allows them to be productive, innovative, competitive, determined, and creative when faced with national and global challenges. The American Welding Society (2013) categorises welding into methods such as forge welding, gas welding, underwater welding, resistance welding, and metal arc welding. Thermit and induction welding are two examples of these processes.

However, fittings are components used to link, regulate, or terminate elements of a metalwork system in the context of metalworking technology. Thomas (2020) lists elbows, tees, reducers, couplings, unions, flanges, caps, and plugs as the most common types of fittings. New materials, smart systems, and improved production processes form the foundation of modern metalworking technology. The welded steel framework design allows these fittings to be linked with plastic pipes (Dobrota et al., 2020). Additionally, they note that a Heat-Affected Zone (HAZ) must be designed into the welded connection to minimise the impact on the plastic pipes' properties, given the presence of the welded joint. So, a country or state may prosper and achieve peace if its citizens are adequately trained and educated in mechanical technology and able to succeed professionally in their chosen fields (Abidoye, 2020). Mechanical technology education, as pointed out by Abalogu and Nwokedi (2024), equips young people, gives them the tools they need to become their own bosses, and helps them achieve financial security and autonomy. So, learning about mechanical technology might be a great way to give young people a voice.

When young people are empowered, it is the process of enhancing their capabilities, resources, and opportunities to make meaningful contributions to society and achieve economic independence (Nwogu & Okwelle, 2021). What we mean by youth empowerment is giving young people the tools they need to improve their own lives and those of those around them. Another way to put it is that it is a tool for encouraging the next generation to achieve greatness, both individually and collectively. In addition to educating and preparing young people for the responsibilities and difficulties of adulthood, youth empowerment is said to empower them in many other ways. It is also said to empower youth and inspire them to pursue self-employment. Additionally, it is characterised as a method of enabling youth to acquire knowledge and pass it on to themselves and society at large. Another way to put it is that it involves letting young people make major life choices on their own, without constant micromanagement. The process of youth

empowerment provides young people with the tools they need to become self-reliant, which in turn reduces the likelihood of cybercrime. When criminals target or utilise computer networks and digital devices, they are committing cybercrime. The phrase encompasses a wide range of crimes committed using these mediums. Onwuadiamu (2025) states that this problem is always changing and affects people, organisations, and governments all around the globe. According to the Economic and Financial Crimes Commission (EFCC, 2023), among other things, internet fraud, phishing, and hacking are prevalent among young people in Nigeria ("Yahoo Yahoo"). Theft, embezzlement, or misappropriation of funds through computer technology or modern devices that replace it is considered cybercrime. Destroying a computer or its software is also considered cybercrime. Illegal actions aimed at the peace and security of mankind on an international level are also considered cybercrime. Cybercrime is defined as any unlawful conduct that gathers evidence via the use of a computer (Pazilovich & Mahammadjonovich, 2021). For instance, in recent years, there has been a dramatic increase in the prevalence of cybercrime, including hacking, virus distribution, and the use of computers to perpetrate other forms of crime such as murder, terrorism, and the theft of sensitive personal information. Theft of sensitive information, illegal drug trade, and fraudulently altering financial transactions via the use of incorrect codes are all examples of cybercrime, as stated by Goni et al. (2022). Cybercrime encompasses a wide range of online offences, including but not limited to: cyberbullying, malware and viruses, illegal information preparation and dissemination, spamming, hacking, illegal website access, fraud, data integrity and copyright infringement, phishing, and farming, among others (Mikkola et al., 2021). Cybercrime among young people is a growing problem, and Okwelle and Oyenuga (2021) argue that this is due in part to their economic hardship and a lack of technical participation.

But recently, cybercrime—especially among Nigeria's youth—has emerged as a major social and economic concern. Cybercrime, such as hacking, identity theft, phishing, cyber fraud (Yahoo Yahoo!), and financial scams, has increased alongside the expansion of digital technologies, mobile devices, and the internet, which has created new channels for communication, entrepreneurship, and economic opportunities (Adebayo & Abdulhamid, 2018). Factors such as youth unemployment, social pressure, the need for instant gratification, and moral decline are contributing to the alarming rise in cybercrime in Nigeria (Okeshola & Adeta, 2019). Cybercrime has become so common, especially financial frauds, that it has changed the way young Nigerians see achievement and hard work. As a result, cybercrime has been revered in Nigerian society (Eze, 2020). On top of that, most young Nigerians lack marketable skills in mechanical technology, which leaves them jobless, and the temptation to become rich fast through cybercrime is growing. This study's main concern is the prevalence of cybercrime among young Nigerians, which may be linked to their limited proficiency in mechanical technology. By deterring foreign investment and confidence in the digital world, this growing trend not only damages the country's global image but also undermines national security, ethical principles, and young people's job prospects (Olayemi, 2014). The government has also tried to address this problem by passing laws like the Cybercrime (Prohibition, Prevention, etc.) Act of 2015 and by creating cybercrime units inside police departments, but the problem is only becoming worse (Aborode et al., 2021).

The main purpose of this study was to determine the roles of mechanical technology education in curbing cybercrimes among youths in Rivers State. Specifically, the sought to determine the:

1. roles of welding/fabrication in curbing cybercrimes among youths in Rivers State.
2. roles of fittings in curbing cybercrimes among youths in Rivers State.

The following research questions guided the study;

1. What are the roles of welding/fabrication in curbing cybercrimes among youths in Rivers State?
2. What are the roles of fittings in curbing cybercrimes among youths in Rivers State?

The following null hypotheses guided the study, and they were tested at .05 level of significance:

1. There is no significant difference between the response mean scores of lecturers and instructors on the roles of welding/fabrication in curbing cybercrimes among youths in Rivers State
2. There is no significant difference between the response mean scores of lecturers and instructors on the roles of fittings in curbing cybercrimes among youths in Rivers State

Methods and Materials

To gather data from a statistically valid sample of the population and draw conclusions about correlations between variables, this study used a descriptive survey research methodology. A total of twenty-eight professors and instructors from Rivers State University and Ignatius Ajuru University of Education in Port Harcourt participated in this study. This study used the entire sample size, as it was feasible. The mechanical Technology Skills and Cybercrime Questionnaire (MTS-CQ) was a structured questionnaire used for data collection. It utilised a five-point Likert scale with the following response options: Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D), and Strongly Disagree (SD). Three (3) specialists in mechanical technology education from the two (2) chosen institutions, as well as one (1) professor from Rivers State University, Port Harcourt, verified the questionnaire. Reliability testing was conducted using the Pearson product-moment correlation, which yielded results of .87 and .89, resulting in a coefficient of .88. The data was gathered by having study assistants hand out questionnaires to the participants. The study questions were answered by analysing the data using descriptive statistics such as standard deviation and mean, and the null hypotheses were tested using the inferential statistic of *t*-test. Any mean answer of 3.5 or more was deemed as "Agree," while any mean response below 3.5 was deemed as "Disagree." The decision-making process was based on the criterion mean of 3.5. The null hypotheses were considered "accepted" when tested with a two-tailed significance level of .05 or above, and "rejected" otherwise.

Results

Table 1: Mean response on the roles of welding/fabrication in curbing cybercrimes among youths

S/N	The roles of welding/fabrication in curbing cybercrimes among youths	Lecturers			Instructors		
		$\bar{X}$	SD	Remark	$\bar{X}$	SD	Remark
1.	Support for construction industries	3.50	1.3	Agree	4.00	.70	Agree
2.	Promotion of entrepreneurship	3.30	.99	Disagree	3.40	1.00	Disagree
3.	Infrastructure Rehabilitation	3.10	.70	Disagree	3.30	.98	Disagree
4.	Innovation and technology development	3.50	1.0	Agree	3.70	.65	Agree
5.	Shipbuilding and marine operations	3.80	.85	Agree	3.80	1.30	Agree
6.	Enhancement of national economy	2.90	.88	Disagree	2.00	.95	Disagree
7.	Production of domestic and industrial equipment	3.60	.96	Agree	3.90	.89	Agree
8.	Skill development and technical training	4.10	1.1	Agree	4.00	1.40	Agree
9.	Employment generation	3.70	.80	Agree	3.50	1.20	Agree
10.	Repairs and maintenance works	4.10	.98	Agree	4.00	.99	Agree
Grand Mean & SD		3.50	.96	Agree	3.56	1.00	Agree

Source: Field Data (2025)

The results in Table 1 revealed that the respondents agreed to a high role with item 1-10, which had the following mean values 3.5, 4.0, 3.3, 3.4, 3.1, 3.3, 3.5, 3.7, 3.8, 3.8, 2.9, 2.0, 3.6, 3.9, 4.1, 4.0, 3.7, 3.5, 4.1, 4.0 with a grand mean of 3.56 and 3.56 and a standard deviation of 1.3, .70, .99, 1.0, .70, .98, 1.0, .65, .85, 1.3, .88, .95, .96, .89, 1.1, 1.4, .80, 1.2, .98. .99 with a grand standard deviation of .956 and 1.00 for lecturers and instructors respectively. The lecturers and instructors agreed that welding/fabrication plays a major role in curbing cybercrimes among youths. The closeness in standard deviation showed that the respondents were homogenous in their responses.

Table 2: Mean response on the roles of fittings in curbing cybercrimes among youths

S/NO	The roles of fittings in curbing cybercrimes among youths	Lecturers			Instructors		
		$\bar{X}$	SD	Remark	$\bar{X}$	SD	Remark
11	Assembly of machine components	4.5	1.2	Agree	3.8	1.0	Agree
12	Precision and accuracy	3.5	.87	Agree	4.0	.98	Agree
13	Testing of mechanical systems	3.7	.99	Agree	3.1	.95	Agree
14	Production of machine tools	2.5	1.0	Disagree	2.9	.79	Disagree
15	Prototype development	3.0	1.3	Disagree	2.9	.85	Disagree
16	Quality control	3.6	.83	Agree	3.8	.77	Agree
17	Reduction of machine failure	3.8	.70	Agree	3.6	1.2	Agree
18	Enhancement of industrial productivity	3.7	1.0	Agree	3.5	.97	Agree
19	Leak prevention in pipe systems	3.4	.98	Disagree	3.9	.88	Disagree
20	Cost reduction	3.0	.96	Disagree	2.8	.85	Disagree
Grand Mean & SD		3.47	.98	Disagree	3.43	.92	Disagree

Source: Field Data (2025)

The results in Table 2 revealed that the respondents agreed to a low role with item 11-20, which had the following mean values 4.5, 3.8, 3.5, 4.0, 3.7, 3.1, 2.5, 2.9, 3.0, 2.9, 3.6, 3.8, 3.8, 3.6, 3.7, 3.5, 3.4, 3.9, 3.0, 2.8 with a grand mean of 3.47 and 3.43 and a standard deviation of 1.2, 1.0, .87, .98, .99, .95, 1.0, .79, 1.3, .85, .83, .77, .70, 1.2, 1.0, .97, .98, .88, .96, .85 with a grand standard deviation of .98 and .92 for lecturers and instructors respectively. The lecturers and instructors agreed that fittings play a minor role in curbing cybercrimes among youths. The closeness in standard deviation showed that the respondents were homogenous in their responses.

Table 3: z-test analysis on the Roles of Welding/Fabrication Skills in Curbing Cybercrimes among Youths in Rivers State

Respondents	N	Mean ($\bar{X}$)	SD	DF	p-value	t-cal	t-crit	Decision
MTE Lecturers	24	3.56	.956	26	0.05	0.00	1.960	H ₀ Accepted
MTE Instructors	4	3.56	1.00					

Source: Field Data (2025)

Table 3 shows that, at 26 degrees of freedom, the calculated value of 0.00 is less than the critical value of 1.960, indicating that there is no significant difference between the response mean scores of Lecturers and Instructors regarding the roles of welding/fabrication in curbing cybercrimes among youths in Rivers State. Hence, the hypothesis was accepted.

Table 4: t-test analysis on the Roles of Fitting Skills in Curbing Cybercrimes among Youths in Rivers State

Respondents	N	Mean ($\bar{X}$)	SD	DF	P-value	t-cal	t-crit	Decision
MTE Lecturers	24	3.47	.983	26	0.05	0.00	1.960	H ₀ Accepted
MTE Instructors	4	3.43	.924					

Source: Field Data (2025)

Table 4 shows that at 26 degrees of freedom, the calculated value of 0.08 is less than the critical value of 1.960, indicating that there is no significant difference between the response mean scores of Lecturers and Instructors on the roles of fittings in curbing cybercrimes among youths in Rivers State; hence, the hypothesis was accepted.

Discussion

The purpose of this research was to examine the relationship between cybercrime and the availability of mechanical technology skills, welding/fabrication, and fittings among Nigerian adolescents in the state of Rivers. The results showed that although Fittings does not directly involve the youth in the fight against cybercrimes through the use of technology, it does play a modest role by providing them with technical skills. Welding/Fabrication, on the other hand, plays a substantial role by providing the youth with the necessary skills and the opportunity for employment. Although the exact subject of study determines the success, this research's results suggest that mechanical technology education may be a good instrument for adolescent engagement. Idibia et al. (2022) argued that welding and manufacturing are still important tools for empowering adolescents and combating social vices like cybercrime; this research backs up their claims. When it comes to this, welding and fabrication are more hands-on because they give the kids a chance to work and be independent, while fittings are more hands-off since they involve them technically. Therefore, mechanical technology training programmes may make a bigger difference in reducing cybercrime among young Nigerians if they included modern technical skills such as information and communication technology literacy, digital machine operation, and computer-aided design.

Fitting as a vocational programme places greater emphasis on mechanical and industrial operations than on digital and information and communication technology (ICT) skills, which may explain why the study found that fitting skills—such as assembling, testing, and maintaining precision in mechanical systems—contribute very little to employment prospects and productive engagements. Consequently, such training is still seen to have little overall impact on reducing cybercrime among Nigerian teenagers, even if it discourages them from participating in such crimes. Consistent with previous research by Olaitan and Nwachukwu (2018); Okoye and Okwelle (2014); and Uwaifo (2009), this study finds that the fitting trade cannot effectively reduce cybercrime among young Nigerians due to the lack of direct digital engagement. On the other hand, encouraging young people to pursue careers in fitting might help curb discontent while also teaching them discipline, dedication, and the value of workmanship.

Conclusion

Education in mechanical technology may play a vital role in reducing cybercrime by equipping young people with marketable skills, fostering independence, and instilling moral values. It also addresses societal and economic factors that contribute to cybercrime, such as joblessness, inactivity, and aimlessness. One way to combat cybercrime and promote sustainable development is for state governments to make strategic investments in mechanical technology education, as in Rivers State. This could channel the creative energies of young people into constructive endeavours. Findings should shed light on how teaching welding/fabrication and fittings as part of a mechanical technology curriculum could help reduce cybercrime among Rivers State's youth. The research found that mechanical technology education may help reduce cybercrime among young people by giving them skills that employers want and encouraging them to be independent.

Recommendations

Based on the findings from the study, the following recommendations were proposed:

1. With the aim of increasing the relevance of mechanical technology education in the fight against cybercrime, it is recommended that digital and ICT-based competencies be incorporated into the training of students undertaking mechanical trades such as welding, fabrication, and fittings.
2. The government should work closely with various industries and training centers to improve the training of youths undertaking mechanical technology.

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