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Impact of cybersecurity skill-up programme on youth unemployment mitigation for community development in Imo State

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Abstract: Youth across societies hold a prominent position and are one of a country's greatest assets. However, many of the youth are idle and unemployed. In Nigeria, NBS reported youth unemployment at 6.5%, and 45.65% in Imo State. This study explored the impact of the cybersecurity skill-up programme on youth unemployment mitigation for community development in Imo State. It was guided by one research objective and one research question. A descriptive survey design was implemented, focusing on a population of 6,700 youth participants in the cybersecurity skill-up capacity-building centers throughout the state. A sample of 469 respondents was chosen using a proportionate sampling method, and the research instrument was a structured questionnaire named "Cybersecurity Skill-up Programme Questionnaire" (CSPQ). For data analysis, the mean and standard deviation were applied to answer the research question. The findings indicate that cybersecurity has enabled youth to work as freelancers and consultants, allowed them to adapt easily to changes in the digital job market, increased their confidence in seeking ICT-related jobs, improved professional networking opportunities for them, equipped them with requisite knowledge to start a technology-based business, and enabled them to support small businesses and organizations in securing their digital systems. The study concludes that cybersecurity skills empowered young individuals to pursue freelance and consulting opportunities and facilitated their adaptability to shifts in the digital job market. It recommends that educational reforms focused on skill development, particularly in digital literacy, computational thinking, and problem-solving, should be introduced even in areas with scarce technological resources.

Keywords: Community development, Cybersecurity, Skill-up, Unemployment, Youth

1. Introduction

Youth, as a subgroup that constitutes part of the community, is seen as the most active structure of community development across various parts of the world. Ebebe and Uzoagba (2023) disclosed that youths across different societies hold a prominent position and constitute one of the greatest assets of a country. Community development as a developmental approach facilitates good employment, sustainable living, and social welfare promotion within and outside the community. According to the World Economic Forum (2024), youth unemployment globally stands at 13%, which represents 65 million people. In Nigeria, youth unemployment stands at 6.5% according to the National Bureau of Statistics (NBS) (Trading Economics, 2025). The NBS statistics in Imo State reported youth unemployment at the rate of 45.6% (Udegbulem & Enajerho-Packson, 2025).

The fountainhead of youth unemployment is deeply rooted in a dearth of information and education, high demands for Information and Communication Technology (ICT) skills from labour market, unfavorable exchange rates, lack of wages and productivity, political instability, corruption, and poverty (Krish, 2018; Aloa

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& Brink, 2020). Youth unemployment triggered a lot of difficulties, leading to poor living standard, financial hardships, social isolation, food insecurity, crimes and homelessness (Tamirat, 2022). Igbokwe-Ibeto & Mac-Ozigbo (2021) argue that the high rate of youth unemployment in Nigeria is due to the negative correlation between the education system and the technical skills needed in the labour market.

In an effort to mitigate youth unemployment, former and present governments have initiated capacity-building programmes aimed at mitigating the unemployment factors hindering youth development. In Imo State, for instance, previous governments organized different capacity-building initiatives such as Youth Must Work, Imo State Youth Empowerment Programme, Imo State Skills Acquisition Programme, Youth Empowerment in Agriculture Programme, among others. However, many of the capacity-building initiatives failed to adequately mitigate the causes and effects of youth unemployment. Ugwuibe et al. Al. (2021) indicated that the Youth Must Work programme did not make a significant impact on the living standards and conditions of the young people of Imo State. Notwithstanding the deficiencies of previous capacity-building programmes, the present governor, His Excellency Senator Hope Uzodimma, through the Ministry of Digital Economy and E-Government, has initiated a skill-up capacity-building programme targeted at equipping the youth with relevant and requisite digital and technological skills to help them overcome unemployment and work-related difficulties. The skill-up programme comprises 16 components: Artificial Intelligence, Internet of Things, Data Management, Fintech, Project Management, Front-End Development, Cybersecurity, among others.

In the context of this study, the researchers focused on the cybersecurity component of the skill-up programme. The International Telecommunication Union (ITU) (2026) explained cybersecurity as the assemblage of tools, policies, security concepts, security safeguards, guidelines, risk management approaches, actions, training, best practices, assurance, and technologies that can be used to protect the cyber environment and organization and users' assets. The acquisition of the cybersecurity skill-up programme has significantly equipped the youth with requisite digital and technological skills needed to overcome youth idleness, work-related difficulties, and unemployment.

2. Statement of the problem

Young people facing unemployment is a widespread issue that impacts various societies around the globe today. Nevertheless, the unemployment rates vary between countries. In Imo State, the issue of youth unemployment continues to be a significant barrier to the progress of community development initiatives. Young individuals, seen as the potential leaders of the future with boundless talents and creativity, are struggling with inactivity and engaging in numerous criminal activities such as internet fraud, armed robbery, kidnapping, prostitution, hacking, human and drug trafficking, identity theft, etc., in their efforts to meet their needs and desires.

The cybersecurity skill development capacity-building initiative has been acknowledged as a tool for reducing youth unemployment. This initiative is designed to equip young individuals with relevant skills and help them address unemployment, tackle various job-related challenges, and make significant contributions to community development in their respective areas. Consequently, the focus of this study is to evaluate the impact of a cybersecurity skill-up capacity-building programme in alleviating youth unemployment for community development in Imo State.

2.1. Research objective and question

1. To ascertain the impact of the cybersecurity skill-up programme in mitigating youth unemployment for community development in the study area.
2. What is the impact of the cybersecurity skill-up programme on mitigating youth unemployment for community development in the study area?

3. Literature review

3.1. Concept of cybersecurity

Cybersecurity stands as an indispensable pillar for safeguarding information systems, networks, and data from malicious threats. It is the process of defending data by averting, identifying, and countering online threats (Tiwaril & Sinha, 2024). These online threats are evidenced in different forms of cybercrimes and cyberattacks. We cannot clearly understand cybersecurity without talking about the various kinds of

cybercrimes and cyberattacks committed in this digital and technology-driven era. Cybercrime, according to Tiwaril & Sinha (2024), refers to criminal activities carried out through the utilization of computers, computer networks, and digital technologies, encompassing a spectrum of illicit actions that exploit vulnerabilities in digital systems, with the intent of financial gain, unauthorized access, disruption, or malicious activities.

On the other hand, a cyberattack is an exploitation of computer systems and networks that uses malicious code to alter computer code, logic or data and lead to cybercrimes, such as information and identity theft (Malla Reddy College of Engineering and Technology, 2020–2021). Lee (2021) observed that many of the cyberattacks on the internet, including nation-state cyberwar, cybercrime, fraud, and scams, are carried out through malware software. Atobatele (2025) defined malware as programmes designed by threat actors to cause harm or gain unauthorized access to systems, often causing reputational damage and potential legal consequences for organizations. Malware classification comes with a wide range of shapes and forms, and they include adware, spyware, ransomware, crypto-malware, trojans, worms, viruses, keyloggers, bots and botnets, fileless malware, and logic bombs (Lee, 2021; Kaspersky, 2023). These malware attacks happen through a variety of physical activities and virtual means such as removable drives, infected websites, phishing attacks, obfuscation techniques, and software from third-party websites (Yasar & Lutkevich, 2024). Having understood the different cyberattacks that gave rise to the importance of cybersecurity as a requisite skill for businesses and organizations to thrive in this 21st century, we shall now discuss what constitutes cybersecurity in detail.

Cybersecurity as a concept is the gathering and coordinating of resources comprising personnel and infrastructure, structures, and processes to protect networks and cyber-enabled computer systems from incidents that threaten the veracity and interfere with property rights, leading to a measurable level of loss (Schiliro, 2022). Cybersecurity serves as the digital shield that protects individuals, businesses, and government from cyber threats (AlmaBetter, 2024). It involves the practices, technologies, and strategies designed to protect digital systems, networks, and data from unauthorized access, attacks, and potential breaches (Goni, Jahangir, & Chowdhury, 2024). Cybersecurity as a foundational skill help young people develop the right skills and knowledge necessary to pursue careers across industries and roles, from IT and engineering to healthcare, education, and public service, promoting economic growth and innovation (Ainabor & Akuza, 2025). Cybersecurity knowledge goes beyond simply recognizing phony emails and creating strong passwords. It encompasses a wider range of ethical issues, responsible online behaviour, and the consequences of digital actions (Rifkin, 2026).

GlobalSign India (2024), cybersecurity enables people to become aware of the risks associated with their online activities and build robust digital defense around their personal information. Caliskan and Vaarandi (2020) established that 20% of youth who participated in a cybersecurity training bootcamp received a permanent job offer as cybersecurity specialists without bearing in mind their educational qualifications, while 80% were successfully accepted for practicum. This infers that several institutions search for candidates who can exhibit real-world knowledge and problem-solving proficiencies rather than formal credentials alone (Alshajahey, 2025).

3.2. Features of cybersecurity

i. Ensures confidentiality by safeguarding sensitive information from unauthorized access.
ii. Ensures that information remains unaltered and trustworthy.
iii. Tries to guarantee the availability of information and services.
iv. Authenticates the uniqueness of user devices or systems trying to access sensitive data.
v. Controls and describes the level of access allowed to legitimate bodies.
vi. Frequently assesses, patches, and updates the systems to strengthen barriers against potential extortion.
vii. Provides individuals with the awareness to diagnose and diminish possible dangers, which will decrease the threat of human error.
viii. Recurrently applies patches and updates to strengthen defenses against incipient extortion and vulnerabilities.
ix. Protect mobile devices, computers, and other applications from virus attacks, unauthorized access, and information leaks.
x. Employs firewalls, intrusion detection systems, and virtual private networks (VPNs) to monitor and control network traffic, preventing unauthorized access and ensuring a secure communication environment (AlmaBetter, 2024).

The cybersecurity features outlined above collectively reinforce the digital backdrop, certifying that the confidentiality, integrity, and availability of information are unaffected.

3.3. Fundamentals of cybersecurity

The three key fundamentals of cybersecurity include: confidentiality, integrity and availability. These three fundamental aspects of cybersecurity were discussed by the Malla Reddy College of Engineering and Technology (2020–2021) as follows:

1. **Confidentiality** is about preventing the disclosure of data to unauthorized parties. Standard measures to establish confidentiality include: data encryption; two-factor authentication; biometric verification; and security tokens.
2. **Integrity** refers to protecting information from being modified by unauthorized parties. Standard measures to guarantee integrity include: cryptographic checksums; using file permissions; uninterrupted power supplies; and data backups.
3. **Availability** is making sure that authorized parties are able to access the information when needed. Standard measures to guarantee availability include: backing up data to external drives; implementing firewalls; having backup power supplies and data redundancy.

3.4. Goal of cybersecurity

Mazanec (2024) classified the goals of cybersecurity into essential and enhanced goals. The essential goals are to:

i. Mitigate known vulnerabilities that could breach organizational networks that are directly accessible from the Internet.
ii. Implement email security to reduce risk from common email-based threats, such as email spoofing, phishing, and fraud.
iii. Add multifactor authentication to protect assets and accounts directly accessible from the Internet.
iv. Ensure basic cybersecurity training among organizational users to learn and perform more secure behaviors.
v. Deploy strong encryption to maintain confidentiality of sensitive data and integrity of Information Technology (IT) and Operational Technology (OT) traffic in motion.
vi. Prevent unauthorized access to organizational accounts or resources by former workforce members, including employees, contractors, affiliates, and volunteers, by removing access promptly.
vii. Ensure safe and effective organizational responses to, restoration of, and recovery from significant cybersecurity incidents.
viii. Use unique credentials inside organizations' networks to detect anomalous activity and prevent attackers from moving laterally across the organization, particularly between IT and OT networks.
ix. Establish secondary accounts to prevent threat actors from accessing privileged or administrative accounts when common user accounts are compromised.
x. Identify, assess, and mitigate risks associated with third-party products and services.

These essential goals assist organizations in addressing common vulnerabilities, improving response, and minimizing residual risk. On the hand, the enhanced Goals enable organizations to mature their cybersecurity capabilities and improve the defenses needed to protect against less common threats. This is done by:

i. Developing and overseeing an asset inventory
ii. Implementing third-party vulnerability disclosure
iii. Establishing cybersecurity testing procedures and norms
iv. Segmenting networks, especially mission-critical assets
v. Centralizing log collection
vi. Centralizing incident planning and preparedness
vii. Managing device and system settings in a consistent manner.

3.5. Unemployment

The most severe form of social inequality, which has caused serious consequences for social and economic stability and created an income deficit, is unemployment (Grainca, 2022). Youth unemployment remains one of the fundamental challenges modern societies are encountering (Papić-Blagojević & Stankov, 2024). The

presence of unemployment reflects a state of economic regression or lack of growth (Agbo, Chukwu & Daniel, 2023). Unemployment is the condition where a person is ready and actively seeking employment but remains jobless due to various obstacles, including insufficient experience, a skill gap, or discriminatory hiring practices (Orji, Onu, Ofozoba & Nditu, 2024). Onyenemezu and Needom (2021) observed that youth unemployment has resulted in a high rate of crimes, including acts of violence, cultism, prostitution, kidnapping, abduction, banditry, and terrorism, committed by young people to satisfy their fundamental necessities. Unemployment among the youth and middle-aged individuals is classified into five groups: fully employed in paid work with government; fully employed in paid work with private organizations; self-employed (skilled); self-employed (unskilled); and unemployed (Ojuolape, Mohd & Benjamine, 2024).

Types of unemployment

i. **Frictional unemployment**: Frictional unemployment is a voluntary, temporary, or short-term unemployment that occurs when workers look for new employment or transition out of old jobs and into new ones (Kagan, 2026).
ii. **Structural unemployment** is a longer-lasting form of unemployment triggered by major alterations in an economy and aggravated by peripheral causes such as competition and globalization, inadequate educational/training programmes, technology, and government policy, industrial composition and labour structure, offshoring, and economic financialization (Yue Shun, 2025).
iii. **Classical unemployment** is described as a process through which wages are being artificially held above the market-clearing level, leading to a surplus of labour (Brooks, 2026).
iv. **Hidden unemployment** refers to a joblessness situation where all individuals are not involved in a professional activity, are available for work, but do not meet the requirements of national systems of unemployment registration (European Commission, 2018b)

3.6. Community development

Community development, which was formally institutionalized at the Cambridge conference of 1948, has been defined according to different standpoints of authorities across the world. The concept of community development encompasses its nature as a process, movement, programme, and method. The process of bringing together members of different communities with governmental authorities and other pertinent stakeholders to enhance living conditions in the affected communities is known as community development (Aruma & Ugwu, 2018). Etebom, Odewale and Okoko (2024) assert that community development is a process essential for achieving specific goals. These goals may be economic, social, cultural, or even environmental, depending on the people's objectives. The process calls for the participation and effort of both the people and their governmental authorities. The essential principles of community development as recognized by Forgead (2017) are self-help, voluntary participation, and felt need.

4. Methodology

The research utilized a descriptive survey design. A descriptive research design is designed to answer the how, what, where, and when questions by providing an observational description of the facts and accurately noting characteristics and behaviors within a specific population (Bazaman, 2025).

4.1. Population and sample

The population of the study comprises 6,700 youth engaged in 10 skill-up capacity-building centers within the state. A sample of 469 respondents representing 7% of the entire population was chosen using a proportionate sampling method.

4.2. Source of data

The research instrument used for this study was a structured questionnaire named “Cybersecurity Skill-up Programme Questionnaire” (CSPQ). The questionnaire comprises six items rated on a modified 4-point Likert scale of Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, and Strongly Disagree (SD). The researchers distributed 469 questionnaires to the participants. Out of these, 40 questionnaires, accounting for 8.53 percent, were not returned, whereas 429 questionnaires, representing 91.47 percent of those distributed, were completed and returned.

4.3. Method of data analysis

The data analysis employed statistical tools such as the mean and standard deviation. The mean and standard deviation were utilized to answer the research question. The criterion mean was 2.50. The items with a mean of 2.50 and above were considered affirmative responses by the respondents, while means below 2.50 were not agreed with by the respondents. i.e. $4 + 3 + 2 + 1 = {}^{10}\!/_{4} = 2.5$

5. Result and Discussion

Table 1: Impact of cybersecurity skill-up programme on mitigating youth unemployment for community development in Imo State

S/N	ITEM	SA	A	D	SD	N	$\bar{X}$	SD	DECISION
		4	3	2	1				
1	The cybersecurity skills I acquired through the skill-up Imo programme has enabled me to work as a freelancer and consultant.	88 352	253 759	50 100	29 29	420 1240	2.95	.777	Agree
2	My cybersecurity knowledge under the skill-up Imo programme allowed me to adapt easily to changes in the digital market job	147 588	126 378	80 160	67 67	420 1193	2.84	1.07	Agree
3	My involvement in cybersecurity skill-up Imo capacity-building has increased my confidence in seeking ICT related jobs.	203 812	132 396	55 110	30 30	420 1348	3.20	.926	Agree
4	My participation in cybersecurity skill-up Imo capacity-building has improved my professional networking opportunities.	138 552	141 423	76 152	65 65	420 1192	2.83	1.05	Agree
5	The cybersecurity skill-up Imo capacity-building programme has equipped with requisite knowledge to start a technology-based business.	191 764	154 462	30 60	45 45	420 1331	3.16	.964	Agree
6	Through the Skill-Up Imo Programme, I have acquired cybersecurity competencies that enable me to support small businesses and organizations in securing their digital systems.	200 800	157 471	45 90	18 18	420 1379	3.28	.822	Agree
	Average Mean						**3.04**		

The data in Table 1 show that the respondents agreed with all the items on the impact of the cybersecurity skill-up programme on mitigating youth unemployment for community development with mean scores of 2.95, 2.84, 3.20, 2.83, 3.16 and 3.28, respectively. Based on a criterion mean of 2.5 and above, the following are considered as impacts of the cybersecurity skill-up programme on mitigating youth unemployment for community development in Imo State:

- **i.** Cybersecurity enables youth to work as a freelancer and consultant.
- **ii.** Cybersecurity allows youth to adapt easily to changes in the digital job market.
- **iii.** Cybersecurity increases youth confidence in seeking ICT-related jobs.
- **iv.** Cybersecurity improves professional networking opportunities among youth
- **v.** Cybersecurity equips youth with requisite knowledge to start a technology-based business
- **vi.** Cybersecurity enables youth to support small businesses and organizations in securing their digital systems.

The average mean of 3.04 confirms the affirmative response of the respondents on the impact of the cybersecurity skill-up programme on mitigating youth unemployment for community development in Imo State.

5.1. Result and Discussion

The data analysed in Table 1 for answering research question indicated that the respondents agreed with all the items on impact of the cybersecurity skill-up programme on mitigating youth unemployment for community development in Imo State. The results exhibited that cybersecurity has enabled youth to work as freelancers and consultants, allowed them to adapt easily to changes in the digital job market, increased their confidence in seeking ICT-related jobs, improved professional networking opportunities for them, equipped them with requisite knowledge to start a technology-based business, and enabled them to support small businesses and organizations in securing their digital systems in Imo State. The aforementioned results

exhibited that the impact of the cybersecurity skill-up programme has positively impacted the mitigation of youth unemployment for community development in Imo State. The present findings are consistent with those reported by Musuva, Ouma, Wambalaba, and Muthusi (2025), which indicated that cybersecurity skills training programmes like Cyber Shujaa significantly address youth unemployment by bridging the skills gap. Correspondingly, findings of Isah and Shehu (2025) showed that empowering youths with digital skills in cyber intelligence not only enhances the security of judicial systems but also contributes to broader national security objectives by building resilience against cybercrime. Findings of Orji, Onu, Ofozoba and Nditu (2024) revealed that cybersecurity is one of the digital skills to be acquired in order to be gainfully employed in the digital economy.

6. Recommendation

Based on the research findings, the paper recommends that educational reforms focused on skill development, particularly in digital literacy, computational thinking, and problem-solving, should be introduced even in areas with scarce technological resources.

7. Conclusion

The study concluded that through cybersecurity skills, young people can work as freelancers and consultants, adapt easily to changes in the digital job market, seek ICT-related jobs, improve professional networking opportunities, start a technology-based business, and support small businesses and organizations in securing their digital systems.

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References

1. Agbo, E. N., Chukwu, B. J., & Daniel, P. (2023). Business education as a recipe for tackling unemployment and growing the Nigerian economy. *Journal of Education in Developing Areas*, 31(2), 376-384
2. Ainabor, A. E., & Akuza, B. O. (2025). Cyber-crimes and youth empowerment for socio-economic development in Nigeria. https://dx.doi.org/10.47772/IJRISS.2025.907000128
3. Alao, A., & Brink, R. (2020). Impact of ICTs for sustainable development of youth employability. Retrieved from https://www.researchgate,net/publication/342616207. https://doi.org/10.4018/978-1-7998-4882-0.ch006.
4. AlmaBetter (2024). What are the features of cyber security? A complete guide. Retrieved from https://www.almabetter,com/bytes/articles/features-of-cyber-security
5. Alshajahey, R. (2025). Learning cybersecurity-self-learning or specialized programs. Retrieved from https://dx.doi.org/10.2139/ssrn.5502138
6. Aruma, E. O., & Ugwu, A. N. (2018). Social development as a catalyst for promotion of community development in Nigeria. *International Journal of Development and Economic Sustainability*, 6(1), 1-9
7. Atobatele, B. (2025). Malware – common attacks and preventions. *Computer and Information Science*, 18(2): 58-68. https://doi.org/10.5539/as:v18n2p58
8. Bazaman, M. (2025). What is descriptive research? A deep dive into its design and application. Retrieved from https://www.kantar.com/inspiration/research-services/what-is-descriptive-research-pd
9. Brooks, T. (2026). Understanding classical unemployment: a comprehensive guide. Retrieved from https://framtida.no/framtida-news/understanding-classical-unemployment-a-comprehensive-guide-1767648208
10. Caliskan, E., & Vaarandi, R. (2020). *Career development in cyber security: bootcamp training programs*. Conference paper presented at the International Conference on Cyber Warfare and Security, Reading, 2020. https://doi.org/10.34190/iccws.20.080
11. Ebebe, I.E. & Uzoagba, B.C (2023). Youth unemployment and crime wave in Owerri municipal council, Imo State. *African Scholar Multidisciplinary Journal`(ASMJ)*, 4, 95-104

12. Etebom, J. M., Odewale, A. D., & Okoko, S. E. (2024). Community development projects: an X-ray of Nsit Ubium Local Government Area of Akwa Ibom State, Nigeria. *International Journal of Research & Innovation in Social Science (IJRISS)*, VIII (V), 2119-2127. https://dx.doi.org/10.47772/IJRISS.2024.805154

13. European Commission. (2018b). Hidden Unemployment. Retrieved from https://www.cedefop.europa.eu/en/tools/vet-glossary/verborgen-werkloosheid

14. Forgead, V. (2017). Why is community development important in nation-building? Retrieved from https://www.smartcapitalmind.com/what-are-the-different-types-of-community-development-projects.htm

15. Goni, A., Jahangir, U.F., & Chowdhury, R.R. (2024). A study on cyber security: analyzing current threats, navigating complexities and implementing prevention strategies. *International Journal of Research & Science Innovation*, X(XII), 507-522. https://doi.org/10.51244/ijrsi

16. GlobalSign India. (2024). Empowering the future: Significance of cybersecurity awareness among youth. Retrieved from https://www.linkedin.com/pulse/empowering-future-significance-cybersecurity-awareness-xezvc

17. Grainca, B. (2022). Methodological basis of unemployment. *International Journal of Social, Political, Economic Research*, 9(1), 163-183. https://doing.org/10.46291/IJOSPERvol9iss1pp163-183

18. Igbokwe-Ibeto, C. J., & Mac-Ozigbo, A. (2021). Youth unemployment and human capacity building in Nigeria: the imperative of entrepreneurship education. *Unizik Journal of Entrepreneurship*, 131-

19. International Telecommunication Union (ITU) (2026). Definition of cybersecurity. Retrieved from https://www.itu.int/en/itu/studygroups/com17/pages/cybersecurity.aspx

20. Isah, M. & Shehu, Z. A. (2025). Youth empowerment on cyber intelligence and national security: a study of E-Affidavit Department of the Federal High Court, Kaduna. *International Journal of Scientific Research in Educational Studies & Social Development*, 6(1),101-118

21. Kagan, J. (2026). Understanding Frictional Unemployment: Causes & Impact. Retrieved from https://www.investopedia.com/terms/f/frictionalunemployment.asp

22. Krish, C. (2018). The future of work in South Africa: the road to 2030; Mimeo, Human Science Research Council-Emerging Markets Sustainability Dialogues: South Africa. Retrieved from https://economic-policy-forum.org/wp-content/uploads/2016/10/futureOfWork-SA-Country-Report-20181008.pdf

23. Lee, W. (2021). Malware and attack technologies (version 1.0.1). The cyber security body of knowledge. Retrieved from https://www.cybok.org/wp-content/uploads/malware_attack_technologies_vo1.0.1.pdf

24. Malla Reddy College of Engineering & Technology. (2020–2021). Cyber security (R18A0521]) lecture notes (B.Tech III Year–II Sem, R18). Department of CSE. Retrieved from https://mrcet.com/downloads/digital_notes/EEE/CyberSecurity.pdf

25. Mazanec, B. (2024). *Cybersecurity Performance Goals. Strengthening the Cybersecurity of the Healthcare Sector and Keeping Patients Safe and Secure*. A manuscript presented at the CMS 2024 Conference Resilient and Ready-Together. Creating an optimal environment for quality healthcare for individuals, families, and communities.

26. Musuva, P. M. W., Ouma, J., Wambalaba, F., & Muthusi, N. (2025). *Addressing the cybersecurity workforce gap: lessons from the Cyber Shujaa program in Kenya*. 2025 IST-Africa Conference (IST-Africa), Nairobi, Kenya, 2025, pp. 1-10, https://doi.org/10.23919/IST-Africa67297.2025.11060504

27. Ojuolape, A.M., Mohd, S., & Benjamine, O.O. (2024). Dataset of youth and middle-aged unemployment in households in Kwara State, Nigeria. *Data in Brief*, 55,1-8.

28. Onyenemezu, E. C. & Needom, R. A. (2021). Influence of vocational education as a drive for youth employment and community development in Port Harcourt local government area of Rivers State. *Rivers State University Journal of Education*, 24(2), 196-206

29. Orji, F. O., Onu, S. C., Ofozoba, C. A., & Nditu, J. K. (2024). Conquering unemployment through opportunities in digital economy: an empirical study of Nigeria and Kenya. *World Journal of Innovation & Modern Technology*, 8(5), 83-94.

30. Papić-Blagojević, N. & Stankov, B. (2024). *Analysis of Trends in Youth Unemployment in the European Union: The Role and Importance of Youth Entrepreneurship*. In Grigorescu, A. & Andrei, J. V. (eds.), Entrepreneurship and Development for a Green Resilient Economy. Emerald Publishing Limited. https://doing.org/10.1108/978-1-83797-088-920241007.

31. Schiliro, F. (2022). Towards a contemporary definition of cybersecurity. Retrieved from https://www.researchgate.net/publication/368304689_Towards_a_Contemporary_Definition_of_Cybersecurity

32. Tamirat, N. (2023). Determinant of youth unemployment in southern Ethiopia: evidence from Duna district, Ethiopia. *International Journal of Financial, Accounting, & Management*, 4(4), 509-520.

33. Tiwaril, A., & Sinha, S. (2024). Cybersecurity necessity and benefits. *International Journal of Law, Policy and Social Review*, 6(1), 73-77

34. Trading Economics (2025). Nigeria youth unemployment rate. Retrieved from https://tradingeconomics.com/nigeria/youth-unemployment-rate

35. Udegbulem, O. C. & Enajerho-Packson, O. P. (2025). Contributions of vocational and technical education on youth unemployment for sustainable community development in Orlu Local Government Area of Imo State. *DELSU Journal of Educational Research & Development*, 22(2), 254-264. https://doi.org/10.61448/djerd22223

36. Ugwuibe, C.O., Onah, F.N., Ogana, M., & Onah, F.O. (2021). Youth unemployment: implementation of youth must work programme in Imo State, 2011-2015. *International Journal of Psychosocial Rehabilitation*, 25(3), 572-583.

37. World Economic Forum (2024). 5 charts that show the state of global youth employment in 2024. Retrieved from https://www.weforum.org/stories/equity-diversity-and-inclusion/global-youth-employment-future-jobs/

38. Yasar, K., & Lutkevich, B. (2024). What is malware? Prevention, detection and how attacks work. Retrieved from https://www.techtarget.com/searchsecurity/definition/malware.

39. Yue Shun, B. W. (2025). Structural unemployment and structural injustice. *Inquiry*, 1–34. https://doi.org/10.1080/0020174X.2025.2501616