



ISSN: 2230-9926

Available online at <http://www.journalijdr.com>

IJDR

International Journal of Development Research

Vol. 15, Issue, 07, pp. 68756-68759, July, 2025

<https://doi.org/10.37118/ijdr.29794.07.2025>



RESEARCH ARTICLE

OPEN ACCESS

BRIDGING THE INDUSTRY SKILLS GAP IN ANAMBRA STATE, NIGERIA THROUGH EFFECTIVE USE OF DIGITAL TECHNOLOGY

Akabuike Nkiruka Maria-Assumpta*¹, Oguagbaka Samuel¹ and Onyesolu Moses Okechukwu²

¹Federal Polytechnic Oko, Anambra State, Nigeria; ²Nnamdi Azikiwe University Awka, Anambra state, Nigeria

ARTICLE INFO

Article History:

Received 11th April, 2025

Received in revised form

26th May, 2025

Accepted 14th June, 2025

Published online 30th July, 2025

Key Words:

Industry skill gap, Block chain, Digital technology, Cyber security.

*Corresponding Author:

Akabuike Nkiruka Maria-Assumpta,

ABSTRACT

Many Industries in South East, Nigeria face labor shortages due to lack of competent hands. This paper explores how digital technology could bridge the skills gap for economic growth in South East Nigeria. 20 randomly selected industries were used for the pilot survey to ascertain the existence of skills gap. Oral interviews of the Human resources personnel to ascertain the academic qualifications of hired staff and industries supervisors to ascertain their experiences with the new employees. Altogether, 10 Human Resource Consultants and 10 technical supervisors were interviewed orally and 100 Questionnaires were distributed to new employees of industries to ascertain their level of knowledge and usage of digital tools while in school and their responses were analyzed. The result showed that digital tools existed in the institutions (Mean = 5.00, $p < 0.05$), but their actual use was below expected levels (Mean = 2.95, $p < 0.05$). The employees' responses confirmed digital tools were available showing that institutions provided the necessary infrastructure, but lack of industry academia collaboration was a problem. Employees awareness of digital tools was neutral (Mean = 2.95, $p = 0.610$), implying gaps in exposure. The results highlight a skills gap in the schools system. While lectures periods appear to be regular (Mean = 4.08, $p < 0.001$; Mean = 4.53, $p < 0.001$), employees disagree that digital tools were used in their lectures delivery (Mean = 2.66, $p < 0.001$). Despite having digital tools, the low usage in lectures and gap in collaboration with the industry (Mean = 3.90, $p < 0.05$) indicate that having digital tools alone does not close the skills gaps. The employers preferred new employees to be properly trained in schools rather than training them on the job.

Copyright©2025, Akabuike Nkiruka Maria-Assumpta et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Akabuike Nkiruka Maria-Assumpta, Oguagbaka Samuel and Onyesolu Moses Okechukwu. 2025. "Bridging the Industry skills gap in Anambra State, Nigeria through Effective use of Digital Technology". International Journal of Development Research, 15, (07), 68756-68759.

INTRODUCTION

South East Nigeria is renowned for its entrepreneurial drive, dense population and a vibrant informal industrial sector (Okeke, 2021). The South East region contributes significantly to Nigeria's economy through commerce, small scale manufacturing and a growing tech and industrial presence. Nnewi, the industrial hub is a major city recognized for its automobile parts manufacturing and home to first indigenous car manufacturing company, Innoson vehicle manufacturing IVM. Bridging the Industry Skills Gap in Anambra State, South East Nigeria is a timely discussion that addresses one of the most pressing challenges confronting the region's industrial sector. As technological advancements and global market dynamics reshape industries worldwide, South East faces an acute shortage of adequately skilled professionals who can meet the evolving demands of modern manufacturing and service industries. Despite its reputation for entrepreneurial spirit and robust small-scale enterprises, the state's industrial landscape is hindered by a persistent skills gap. This paper examines the existence of skills gap, root causes of the skills mismatch (if any) by exploring the interplay between current educational practices and the specific requirements of local industries.

It draws on a range of empirical data, stakeholder interviews to illustrate how traditional training methods fail to equip the workforce with critical competencies. By proposing a comprehensive framework for bridging the skills gap, through digital technology, this research aims to highlight not only the challenges but also provides actionable recommendations that can serve as a blueprint for similar regions facing analogous issues in Nigeria and beyond. Digital technology presents a promising solution to the challenges in the industry in South East Nigeria, by democratizing access to quality education and professional training. E-learning platforms, AI-driven personalized learning, virtual reality simulations and block chain credentialing is among the innovations reshaping workforce development. There is a difference between skills employers need and the skills the work force offers. This is called skill gap. Such gaps may include; critical thinking/problem solving, Paying attention to details, Communication, Leadership and Teamwork, Adaptability, productivity, work ethics and emotional Intelligence (Akabuike, 2024). This misalignment affects various sectors, including manufacturing, information and communication technology (ICT). Although south East Nigeria benefits from a dynamic informal economy and strong entrepreneurial activities, it still faces significant challenges in addressing youth unemployment and under employment

(NBS, 2025). These are in the face of increased demands of skilled workers across various industries. Asamani, (2025) stated that planning a future driven by Fourth industrial Revolution and the rise of automation, advanced manufacturing, digital transformation and Artificial intelligence, the question emerges on how best to prepare South East workforce for the new age. Thus the problem lies in industries being in dire need of workers yet there are many unemployed but unemployable youths in the job market.

The objectives of the paper to

- (i) Determine if there are skills gap between the educational institutions and the industries.
- (ii) Determine the cause(s) of the skills gap and how to close the gaps using digital tools if they exist
- (iii) Discover how the industries close the skills gaps
- (iv) Highlight challenges affecting the effective use of the digital tools.

MATERIALS AND METHODS

The materials used in this research included oral interviews and questionnaires which were the primary sources of data which provided information addressing the research problems. Statistical tools used for the presentation and analysis of collected data were tables, charts and descriptive statistics. 20 industries were randomly selected to represent different sectors of the economy; Agriculture and Manufacturing industries. The human resources unit and the technical supervisors were interviewed on the caliber and qualifications of staff employed their competences with respect to the use of the companies' digital tools and the solution to any observed skill gap of the staffs.

RESULTS

Use of Digital tools for the lectures in the school system

S/N	Question	Mean	STDV	t-value	Mean Diff TestValue = 3	Sig. (2-tailed)	Interpretation
A1	I am aware of digital tools	5	0	12.76	1.34	.00	High awareness of digital tools.
A2	My school had digital tools in the labs	5	0	8.66	0.82	.00	Digital tools are available.
A3	My lecturers made use of digital tools while teaching	3.95	0.69	-4.29	-0.34	.00	Below exp. use of digital tools.
A4	My lecturers had good knowledge of the use of the digital tools	4.7	0.47	-0.74	-.078	.46	Lect.have good knowledge.
A5	My lecturers were willing to use the digital tools for teaching	3.9	0.64	3.16	0.21	.00	Some resistance or lack of enthusiasm.
A6	Students preferred the digital tools to be used	5	0	5.96	0.67	.00	Strong preference for digital learning.
A7	Students used the digital tools for their assignments	4.6	0.50	-0.55	-0.05	.59	Regular use, but some inconsistencies.

Cause(s) of the skills gap

Question	Mean	STDV	t-value	Mean Difference Test Value = 3	Sig. (2-tailed)	Interpretation
Students lack of Interest	2.59	.49	-8.85	-.40	.000	Students disagree that their lack of interest is a major cause of the skills gap. The mean (2.59) is below 3, and the significant p-value (.000) confirms this result.
Lecturers lack of interest	3.01	1.53	.12	.017	.904	The mean (3.01) is very close to neutral, and the high p-value (0.904) suggests that there is no strong evidence to confirm or reject this as a major cause.
Lack of necessary tools including electricity	3.87	1.03	9.18	.87931	.000	Respondents agree that the lack of necessary tools in schools is a significant cause of the skills gap. The mean (3.87) is well above 3, and the p-value (.000) is significant.
Incompetent lecturers	2.94	1.12	-.49	-.05	.622	The mean (2.94) is slightly below neutral, and high p-value (.622) suggests that lecturer incompetence is not statistically significant
Obsolete infrastructure/curriculum	3.71	1.11	6.89	.71	.000	The mean (3.71) is significantly above 3, and p-value (.000) confirms that obsolete digital tools are a major contributor to the skills gap.

Each of the staff reported on by the supervisor was administered with a questionnaire to determine the level of knowledge and use of digital tools by the staff. 100 questionnaires were administered in all to the new employees of the 20 industries to ascertain their knowledge of digital tools and to what extent their lecturers used the digital tools while teaching them. The results of the responses from the interviews and questionnaires were tabulated and analyzed using measures of central tendencies. The result found that employees (Mean = 5.00, $p < 0.05$) were aware of digital tools. Digital tools were found to exist in the higher institutions (Mean = 5.00, $p < 0.05$), but lecturers' actual use is below expected levels (Mean = 2.95, $p < 0.05$). This suggests a gap between digital tool availability and classroom integration, which could lead to a skills mismatch in the industry. While employees confirmed that their lecturers knew about digital tools (Mean = 4.70, $p > 0.05$), they were not mostly used in delivering their lectures. The lecturers' willingness to use them was slightly lower (Mean = 3.50, $p < 0.05$). If educators hesitate to use modern technology, students may graduate with outdated methods, leading to skill misalignment with industry expectations. Employees confirmed that they preferred to use digital tools in their assignments (Mean = 4.60, $p > 0.05$). However, lecturers did not integrate them effectively into their teaching (Mean = 2.95, $p < 0.05$). This disconnect suggests that institutions are not aligning their teaching methods with industry digital transformations.

The main causes of the skills gap according to the respondents are:

Lack of necessary tools and electricity in schools (Mean = 3.87, $p = .000$); Obsolete curriculum (Mean = 3.71, $p = .000$); Lack of student interest (Mean = 2.59, $p = .000$) was not considered a significant cause; and Lecturer incompetence (Mean = 2.94, $p = .622$) was also not identified as a major problem. These results support the research objective that skills gap exists and that it is largely due to insufficient and outdated resources rather than lack of effort by students or

lecturers. Addressing these infrastructure gaps could significantly improve workforce readiness.

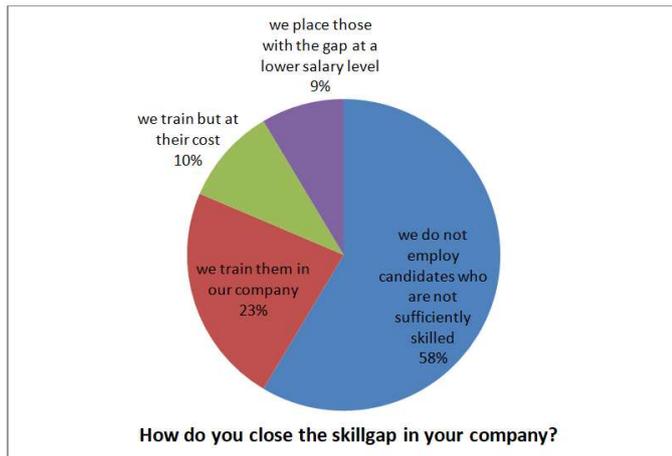


Figure 1. Pie chart on how companies address skill gaps

DISCUSSIONS

From the responses from the oral interview of the Technical supervisors, all supervisors confirmed that there are skills gaps in all the sectors studied particularly in the manufacturing industry and Medical industries despite the responses from the HR consultants that they always shortlisted candidates whose performance in school is considered above average and recruited the best performing candidates in the interview. All the HR consultants in the different companies confirmed that the employees always performed well in the oral questions administered during the interviews. This is expected as candidates shortlisted for interview are the best of the lot since all the industries confirmed that they always invited the best performing students for the interviews (Those who either graduated with a first class, distinction or upper class depending on polytechnic or university graduate). This may be why most of them performed well in the oral interviews. 59% of the HR consultants responded that any candidate who had no good knowledge of the use of digital tools is not employed. This is not surprising going by the number of unemployed youths in the region. Companies do not want to employ staffs who are liabilities to the company as training the new staff would incur extra cost on the companies particularly for staff who would still be placed on probation until such a time they have proven their worth and be confirmed.

Only 23% of the company responded that their newly employed staffs were always subjected to training on how to use the digital tools they used in their industries at different levels for better efficiency confirming the existence of skills gap. They however remarked that it was a huge debt burden on the company and they would prefer it didn't exist. This explains why companies prefer employing experienced staff rather than fresh staffs from school. 10% of the respondents said that if they are to employ the staff without expertise on digital tools, they are indemnified against the cost as the cost of training would be borne by them through deduction of an agreed sum monthly until the cost is defrayed. They however said that the candidates were usually not happy with that as some of them decline signing the indemnity form and so will not accept the job offer. 8% of the companies said that such candidates who didn't have digital skills but performed excellently well in the job interview were offered a job but with a grade level below those who were digitally skilled until such a time they picked up the skills. This they said was their own way of making the employees pay for the skill they would eventually pick from the company. About 20% of the new employees didn't need training but it was further discovered that they went for personal training to acquire the digital skills they had. All employees equally agreed that their lecturers didn't effectively use the digital tools during lectures. Some said that electricity supply was epileptic and so

affected their usage. Most of the employees however accepted that their lecturers mentioned the existence of digital tools but rarely used them during lecture hours.

Factors responsible for the skills gap in Industries: From the responses of the respondents, several factors were identified as causes of the Industry skills gap. They include:

- (i) **Outdated Curriculum:** Some curricula being used in the education system were developed before the advent of the modern digital tools we have now. As a result of that, the use of the digital tools has not been integrated into the curricula creating the skills gap as is being experienced in the workforce. Also some digital tools have become obsolete and no longer fit the state of the art industry of the day in terms of speed, quality and output. Limited vocational Training: the funding of the Technical and vocational training programs in schools are either underfunded or underutilized. Inadequate trainers for the students remain a problem. Some of the lecturers still have obsolete information and may not have good knowledge of use of digital tools.
- (ii) **Lack of Industry- Academia collaboration:** Training institutions rarely align their programs with market needs. Emphasis remains on being book smart rather than being able to practical use of the acquired knowledge. In Nigeria for example the education curriculum is not helping matters as it emphasizes on grades and not on the application of the knowledge (Akabuike, 2024). Some schools still run curriculum developed before the advent of digitalization. The poor economic situation in most African countries has contributed to lack of Industries. In Nigeria for example about 7.2 million businesses closed down between 2023-2024 which gave a loss of about 94 trillion naira (Omisakin, 2025). Students short cuts in their industrial training is also a major snag as the aim of the compulsory industrial training program is defeated when students play truancy during the period. This truancy is as a result of the non monitoring of the students by their assigned supervisors either due to non-payment of supervision allowance or due to restricted movement caused by insecurity.
- (iii) **Digital Divide:** Many Africans lack access to digital learning tools due to poor internet penetration and high costs (ITU, 2021). Some areas are still very remote and lack basic infrastructure for technological advancement. This includes needs as basic as electricity.
- (iv) **Incompetent lecturers:** Another factor as recorded in the responses is the incompetence of lecturers. Some employees recorded that some lecturers particularly the elderly ones who studied before the advent of the digital tools have no knowledge of such tools and so were not able to use them to deliver their lectures.
- (v) **Lack of interest on the part of the students:** students sometimes do not show enough interest particularly when they feel that all the struggles wasted in school was a scam as they are easily employed after graduation. This mind set has led to the frustration of our youths out of school creating another cankerworm in the society. The poor economy is not helping matters as money paid a civil servant is poor going by the inflation rate when compared to the minimum wage

CONCLUSION

Digital Technology as a solution to the skills gap

- (i) **E-learning and online Education:** In recent times, e-learning platforms like Coursera, Udemy and African led initiatives such as eLearnAfrica provide accessible, scalable and cost effective education solutions (Chaka, 2021). These platforms enable self paced learning allowing individuals to acquire industry relevant skills irrespective of geographical barriers. The implication is that learning can take place in the comfort of the home and

within one's geographical space. This makes learning cheaper and affordable to some extent since the cost of transportation, accommodation and travel inconveniences are eliminated with e-learning platforms.

- (ii) AI-driven personalized learning: AI-powered learning systems can tailor educational content to individual needs, improving retention and efficiency. Adaptive learning platforms such as Century Tech use AI to analyze students' progress and customize coursework accordingly (Nguyen & Brynjolfsson, 2020). AI also offers the advantage of hands on training. Documented procedures in videos assist even slow learners to learn due to repeated watching of the videos. It also gives the advantage self tutoring using the AI powered learning tools
- (iii) Virtual Reality (VR) and Augmented Reality (AR) for Hands-on Training. VR and AR technologies provide immersive training experiences for technical fields like healthcare, engineering and manufacturing. In Rwanda, for instance, VR-based training programs have been implemented to enhance medical education (Mugisha, 2022). These virtual platforms eliminate the need for physical presence of teachers and students thus offering the advantage of learning from any geographical location.

Digital Apprenticeships and Remote work platforms: Platforms like Andela and Gebeya connect African talent with global job opportunities, providing digital apprenticeships in software development and other high-demand fields. (Oyelaran-Oyeyinka, 2021). The advantage is that indigent individuals who cannot afford to pay for trainings in the locations where the trainings are taking place are able to acquire such trainings without being physically present at the training location and job offers are equally available in such platforms for the highly skilled who would not have otherwise had the opportunity to be known and employed.

Block chain for Digital Credentialing: Block chain technology ensures the authenticity of digital certifications, reducing credential fraud and increasing employer confidence in online qualifications. Institutions such as the African Digital Academy have adopted block chain based certification to verify skills training (Burgess, 2021)

Challenges in Implementing Digital Solutions

- **Limited Digital Infrastructure:** Many African Regions lack stable internet connectivity and electricity, hindering digital learning adoption (ITU, 2021).
- **High cost of Technology:** The affordability of digital devices and internet access remains a barrier to widespread adoption (Chaka, 2021).
- **Resistance to change:** Traditional educational institutions and industries often resist digital transformation due to unfamiliarity for fear of job displacement (Ilo, 2022). Some institutions are averse to change and so are not able to imbibe change either due to beliefs or inertia or even fear of the probable cost of change. The idea of doing it the old way it is done prevents industries from taking advantage of the huge advantage digitalization offers. This thus leads to low productivity, poor product quality and eventually closure of the industry if it is not able to compete with the highly advanced digitalized companies.
- **Policy and Regulatory Constraints:** Many African governments lack comprehensive policies supporting digital education and skills development (World Bank, 2022). Some policies may be in place but lack implementation strategies or when the strategies are in place, mismanagement and corruption prevents the take off of laudable projects.

- **Cyber security threats:** The rise in cyber attacks has significantly outpaced the development of defensive mechanisms, leaving many organizations vulnerable to a variety of cyber security threats. (Akabuike, 2025). This has discouraged industries like the small and medium scale industries from investing in digital tools for fear of losing their data through digital attacks.

It is imperative that there should be a total overhaul of the education system in South East Nigeria emphasizing on using digital tools as a teaching aid for productivity. This will drive the training to a productive learning hence creating more employable youths thereby reducing unemployment and improving the economy. This level of training should not be for the big industries alone. It should include the Micro scale and medium enterprises (MSME) which on their own hold the economy of a nation. Bridging the Industries skills gap in Africa through digital technology is important for economic growth and global competitiveness. E-learning, AI driven education, VR training and block chain credentialing provide scalable solutions to workforce development challenges. However addressing digital infrastructure gaps, affordability issues and policy constraints is crucial for successful implementation. Governments and private sectors and educational institutions must collaborate to build an inclusive digital skills system, ensuring Africa's workforce is equipped for the future.

REFERENCES

- Akabuike, N.M 2025. *Cyber Security Threats and Digital Governance: An Evolving Landscape*. Conference paper presentation of school of financial studies Federal polytechnic Oke.
- Akabuike, N.M. 2024. *The Role of Mathematics in closing the gap between skills acquisition and Entrepreneurship for Economic Development in Nigeria*. Global Scientific Journal Publication. Vol. 12(11)
- Asamani, G 2025. Africa top news magazine. <https://www.africantopmagazine.com/rwanda-tech-future>.
- Burgess, M. 2021. *Block chain for education: A game-changer in digital credentialing*. Journal of Digital Transformation, 6(2), 45-58.
- Chaka, C. 2021. *Digital learning and the future of Education in Africa*. African Journal of Education and Technology, 10(1), 78-94.
- Ilo, C 2022. *Skills for a changing world: The role of technology in employment*.
- ITU 2021. *Information and communication Technology Trends and Developments in Africa Region 2017-2020*. <http://handle.itu.int/11.1002/pub/81836c3c-en>
- Kenyan Ministry of ICT, 2021. *Ajira Digital: Empowering youth through digital jobs*.
- Mugisha, P. 2022. *Virtual reality in medical training: Rwanda's success story*. African Medical Journal, 15(4), 112-126.
- Okeke, M.C. 2021. *The political economy of regional development in South East Nigeria*. Journal of Nigerian Development Studies, 10(4), 101-117
- Omisakin, S 2025. Private sector Outlook report.
- Oyelaran-Oyeyinka, B. (2021). *The rise of Africa's digital workforce*. Technology and Society Review, 9(3), 33-47.
- Wanneburg, G 2024. *The African Development Bank Report on Workforce Skills Developmen*. African Economic Outlook launch
- World Bank. 2022. *The future of work in Africa: Preparing for the digital economy*.
