

EMPLOYMENT PATTERNS AND JOB SECURITY: THE SOCIO-ECONOMIC IMPACT OF TECHNOLOGICAL INNOVATION

MUOGBO NGOZI

Department of Social Sciences, School of General Studies, Federal Polytechnic, Oko

Corresponding Author's Email: ngozimuogbo@gmail.com

D.O.I: 10.5281/zenodo.17257711

ARTICLE INFORMATION

Received: 15th January, 2025
Accepted: 13th February, 2025
Published: 27th March, 2025

KEYWORDS: Employment Patterns,
Job Security, Socio-Economic Impact,
and Technological Innovation

Journal url:
<https://ijois.com/index.php/jobpef>

Editor-in-chief: Assist. Prof. Dr (C) Ari
Riswanto

PUBLISHER: Empirical Studies and
Communication – (A Research Center)
Website: www.cescd.com.ng

ABSTRACT

This study investigates the socio-economic impact of technological innovation on employment patterns and job security in Anambra State, Nigeria. Employing a descriptive survey research design, data was collected from a sample of 400 respondents representing various sectors of the Anambra State labor market. A structured questionnaire with both closed and open-ended questions was utilized, validated through content and face validation, and tested for reliability using Cronbach's alpha coefficient. Data analysis involved descriptive statistics to summarize findings and inferential statistics including Pearson's correlation and multiple regression analysis to test hypotheses. Results revealed a strong positive correlation between technological innovation and both employment patterns and job security, indicating significant socio-economic implications of technological advancement in the region. The study concludes that while technological innovation offers opportunities for economic growth, it also poses challenges such as job displacement and skill mismatches. The paper recommends that Anambra State government should explore diversification strategies to reduce reliance on sectors vulnerable to technological disruption. This could involve promoting industries with high growth potential, such as renewable energy, healthcare, and tourism.

1.0 INTRODUCTION

Since the early 1970s, technological advancement has occurred at an astounding rate, and this trend is only going to quicken. Innovation in technology has always been an indicator of human advancement, impacting our daily lives and the way we make a living. Success criteria have evolved throughout history, with innovations such as the Industrial Revolution's mechanisation and the advent of AI reshaping entire sectors. This advancement, nevertheless, is not without

its drawbacks. The rise of AI, robotics, and automation has reshaped conventional wisdom about work, eliminating some jobs while opening up others. The rapid expansion of digital technology has intensified this change, calling into question the current state of the workforce (Brynjolfsson and McAfee 2014). While innovation creates new opportunities and fosters productivity, it can also disrupt existing employment patterns and raise concerns about job security. This paper examines the relationship between technological innovation, employment patterns, and their socio-economic impact. Traditionally, technological advancements were viewed as net job creators. The Industrial Revolution, for instance, ushered in an era of factory work, replacing manual labor in some sectors while generating new demands in others (Lima et al., 2021). However, the pace of innovation has accelerated dramatically in recent decades, with automation and artificial intelligence (AI) threatening to disrupt a wider range of occupations (Goos et al., 2019). Studies by Frey and Osborne (2017) suggest that a significant portion of jobs in the US are susceptible to automation, raising concerns about widespread job displacement. Significantly, the rapid technological advancement over recent decades has fundamentally reshaped employment patterns and job security, creating a complex socio-economic impact that demands careful analysis and proactive solutions. Technological innovation, often seen as the engine of progress, has a dual nature in its impact on the workforce: while it can drive productivity and create new job opportunities, it can also lead to job displacement and increased insecurity. This relationship between technology and employment necessitates an examination of how employment patterns are evolving, the implications for job security, and the broader socio-economic consequences.

Technological innovation has drastically altered the traditional employment environment. The rise of automation, artificial intelligence (AI), and digital platforms has transformed how work is conducted, leading to the emergence of new industries and the decline of others. For instance, manufacturing sectors that once provided stable employment have seen significant job losses due to automation. According to a study by the McKinsey Global Institute, up to 375 million workers worldwide may need to switch occupational categories and learn new skills by 2030 due to automation (Manyika et al., 2017). Concurrently, there has been a surge in demand for tech-savvy professionals capable of navigating and harnessing new technologies. This shift has resulted in a polarized job market where high-skill, high-wage jobs grow alongside low-skill, low-wage ones, while middle-skill jobs are increasingly automated (Autor, 2015). According to Autor and Dorn (2013), the impact of technological innovation is not always straightforward displacement. Autor and Dorn propose the concept of job polarization, where technology automates routine tasks, leading to a decline in middle-skill jobs and a rise in both high-skilled (e.g., data analysis) and low-skilled (e.g., personal care) positions (Goos et al., 2019). This phenomenon highlights the growing importance of skills development and lifelong learning for workers to adapt to the changing job market. Moreover, there are ongoing debate surrounding the net effect of technological innovation on employment. Some argue that history has shown technological advancements ultimately create more jobs than they displace, albeit with a period of adjustment (Ra et al., 2019). Others, however, express concerns about the speed and scale of current technological disruptions, fearing a future with widespread unemployment (Kapstein, as cited in Frey & Osborne, 2017). On the one hand, research by Chennells and van Reenen (1999) suggests that product innovation, by creating new products and industries, can lead to employment growth. Conversely, studies by Acemoglu and Autor (2011) highlight a potential for wage stagnation and income inequality, particularly for those lacking the skills necessary to thrive in the new economy.

Furthermore, Autor et al. (2020) investigate how technology advancements, particularly those that are skill-biased, contribute to pay disparity. In addition, research by Brynjolfsson and McAfee (2014) and Frey and Osborne (2017) explores how AI and robots could affect future job opportunities, which makes some people worried about their job security. Innovation may

ultimately lead to the creation of new job opportunities, according to research by Mokyr (2018), which highlights the labour markets' historical resiliency in adjusting to technological change. Thus, technological advancement affects more than only people's ability to keep their jobs (Acemoglu & Restrepo, 2019). Income disparity, social unrest, and a burden on social safety nets are some of the ripple impacts that communities may experience as a result of job displacement. Worries about the future of employment and automation-induced unemployment are also ethically troubling. Although the gig economy, fueled by digital platforms like Uber, TaskRabbit, and freelance marketplaces, exemplifies the changing nature of work. Gig work offers flexibility and autonomy but often lacks the stability and benefits associated with traditional employment (Katz & Krueger, 2016). This evolution towards more fluid and less predictable work arrangements has significant implications for job security, affecting how individuals plan their careers and manage economic uncertainties.

As employment patterns evolve, job security becomes a central concern. The displacement of workers by technology, a phenomenon often referred to as "technological unemployment," poses a significant threat to job stability. While new technologies can create jobs, the skills required for these new roles often do not match those of displaced workers, leading to skill mismatches and prolonged periods of unemployment (Bessen, 2019). This misalignment is evident in the decline of routine-based jobs and the rise of jobs requiring complex problem-solving and interpersonal skills (Autor, Levy, & Murnane, 2013). However, the gig economy and the rise of contract-based work have introduced a new dimension of insecurity. Workers in these roles typically do not enjoy the protections and benefits of full-time employment, such as health insurance, retirement plans, and job stability (De Stefano, 2016). This precarious nature of work can lead to increased financial instability and anxiety among workers, affecting their long-term economic prospects and overall well-being. For instance, low-skilled workers in industries susceptible to automation face higher risks of unemployment and downward mobility. This contrasts with high-skilled workers, who are often better positioned to adapt to technological changes and may even experience enhanced job security as their skills become more in demand (Autor, 2015). A study by the International Labour Organization (ILO) highlights the growing incidence of temporary and part-time work, which often lacks the social protections of traditional employment (ILO, 2018). Moreover, the concept of "future-proofing" one's career has gained prominence, with continuous learning and adaptability becoming essential. The responsibility for this upskilling often falls on individuals rather than employers, creating disparities based on access to education and training resources (World Economic Forum, 2018). Additionally, the rapid pace of technological change means that workers must continually update their skills to remain competitive. Lifelong learning and continuous professional development have become essential strategies for maintaining employability. This necessity places additional pressure on workers and can exacerbate inequalities, as those with fewer resources or less access to education may struggle to keep up (Goldin & Katz, 2018). Thus, job security in the technological era is increasingly tied to one's ability to adapt to rapid changes and acquire new skills continuously.

Stupendously, the socio-economic impact of technological innovation extends beyond the individual to broader societal and economic structures. On the positive side, technological advancements have the potential to drive economic growth, increase productivity, and improve living standards (Brynjolfsson & McAfee, 2014). Innovations in healthcare, transportation, and communication can enhance quality of life and create new economic opportunities. For example, advancements in medical technology can lead to better health outcomes and increased life expectancy (Bloom, Canning, & Sevilla, 2014). Moreover, this advancement also impacts age and gender dynamics within the workforce. Younger generations, who are generally more tech-savvy, adapt more easily to new technologies, potentially marginalizing older workers who may struggle with technological adoption. Additionally, gender disparities are evident, as

women are underrepresented in STEM fields where many new opportunities are emerging. The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2021) reports that women constitute only 28% of the global STEM workforce, highlighting the need for policies promoting gender diversity in these areas. The work environment is evolving due to technological innovations. Remote work, facilitated by digital communication tools, has become increasingly prevalent, especially post-COVID-19. This shift offers flexibility but also blurs the boundaries between work and personal life, affecting work-life balance and mental health (McKinsey Global Institute 2019). Companies must adapt by fostering inclusive and supportive work environments that address these emerging challenges. However, these benefits are not evenly distributed. The disparity between those who can adapt to and benefit from technological changes and those who cannot leads to greater economic inequality. Regions with higher concentrations of tech industries and skilled workers tend to thrive, while others, particularly those reliant on manufacturing and low-skill jobs, face economic decline (Moretti, 2012). This geographic polarization is evident in the contrasting fortunes of tech hubs like Silicon Valley and former industrial centers in the Rust Belt. Moreover, the social fabric is affected as traditional career paths and community structures are disrupted. Job displacement and insecurity can lead to social unrest and a sense of disenfranchisement among those left behind by technological progress (Standing, 2011). The rise of the "precariat," a social class characterized by precarious employment and economic instability, underscores the broader societal implications of these changes (Standing, 2014). Policymakers are thus challenged to create inclusive policies that ensure the benefits of technological innovation are broadly shared and that support systems are in place to aid those adversely affected. Initiatives such as universal basic income, job retraining programs, and stronger social safety nets are being explored to address these challenges (Berg et al., 2018). The OECD advocates for policies that promote inclusive growth, emphasizing the need for education, training, and social protection systems that can adapt to the changing nature of work (OECD, 2018). In light of the foregoing debate on the rapid advancement of technology and its significant transformation on workforce on employment patterns, reshaping job security and creating profound socio-economic impacts, the following goals are the focus of the current investigation:

1. Analyze the relationship between technological innovation and employment patterns in Anambra State.
2. Evaluate the impact of technological innovation on job security in Anambra State labor market.

1.2 Research Questions

This study aims to answer the research questions as follows:

RQ1: How does technological innovation affect employment patterns in Anambra State?

RQ2: What is the impact of technological innovation on job security in Anambra State labor market?

1.3 Research Hypotheses

The following hypotheses will be tested at a 0.05 significant level

Hypothesis 1: There is no significant relationship between technological innovation and employment patterns in Anambra State.

Hypothesis 2: There is no significant impact of technological innovation on job security in Anambra State labor market.

2.1 Theoretical Framework

2.1.1 Structural Transformation Theory

Structural Transformation Theory, often associated with the work of economist Arthur Lewis, explores the process through which economies transition from agrarian-based to industrialized societies. The theory posits that technological advancements play a crucial role in driving this transformation by facilitating shifts in employment patterns and sectoral composition (Lewis, 1954). According to Lewis, as technology improves and productivity increases in the industrial sector, labor is drawn away from agriculture towards more productive and higher-paying manufacturing jobs. This structural transformation leads to changes in the distribution of labor, income, and opportunities within the economy. In the context of the socio-economic impact of technological innovation on employment patterns and job security, Structural Transformation Theory explains how technological advancements reshape economies and workforces. As technology improves, industries like manufacturing become more productive, requiring fewer workers. This labor force then shifts to growing sectors, often service-based. This shift creates new employment patterns. While some jobs disappear, others emerge. However, the transition can be bumpy. Workers in declining industries may struggle to find new roles requiring different skillsets. This can lead to job insecurity and income inequality. The theory emphasizes the importance of education and training to equip workers with the skills needed to thrive in the new economy. Additionally, policymakers can play a role by fostering innovation in growing sectors and providing support for workers displaced by automation.

2.1.2 Skill-Biased Technological Change Theory

Authors David Autor, Lawrence Katz, and Alan Krueger (1998) put out the Skill-Biased technology Change (SBTC) Theory as a framework for understanding how technology progress influences the demand for various skill sets in the job market. New forms of automation and information technology, according to this notion, can do ordinary jobs that low- and medium-skilled individuals used to do, while also benefiting highly skilled professionals. Consequently, technological progress separates the labour market into high-skilled and low-skilled occupations, with the former seeing relative growth and the latter seeing relative decline (Autor, Katz & Kearney, 2003). The Skill-Biased Technological Change Theory contends that technological breakthroughs have an outsized effect on the demand for certain skill sets, within the framework of the socio-economic effects of technological innovation on employment patterns and job security. In many cases, skilled workers benefit from new technology, which increase their worth and productivity. Unskilled workers, on the other hand, could become expendable, which would mean fewer jobs and lower earnings. A more divided labour market is the result of this change. While low-skilled employment shrink, high-skilled jobs boom as regular, manual labour is mechanised. According to the hypothesis, when there is a greater demand for competent workers than there are available, income disparity will increase.

2.2 Empirical Review

Bughin, Hazan, Ramaswamy, Chui, Allas, Dahlström & Henke (2018) assessed the potential impact of automation and AI technologies on the future of work and employment across various

sectors and occupations. Drawing on insights from industry experts, economic analysis, and case studies, the authors developed scenarios to explore the implications of automation and AI for job displacement, skill requirements, and organizational structures. The study identified significant opportunities for automation and AI to enhance productivity, innovation, and economic growth. However, it also highlighted challenges related to job displacement, skills mismatches, and ethical concerns surrounding the use of AI technologies. The authors recommended a multi-faceted approach to managing the transition to an automated economy, including investments in education and training, support for displaced workers, and proactive regulation to ensure the responsible deployment of AI technologies.

Dengler, Matthes & Paulus (2018) analyzed the potential effects of digitalization and automation on employment and skills requirements in Germany. Using data from the German Federal Employment Agency and other sources, the authors conducted a quantitative analysis to examine the relationship between digitalization, job polarization, and skill demand across different sectors and regions. The study found evidence of job polarization, with employment growth concentrated in high-skill and low-skill occupations, while middle-skill jobs experienced relative decline. Moreover, digitalization was associated with increased demand for cognitive and social skills, as well as a shift towards non-standard forms of employment. The authors recommended policies aimed at promoting lifelong learning, enhancing digital literacy, and fostering innovation to support workers' transition to the digital economy and mitigate the risks of technological displacement.

Manyika, Lund, Bughin, Woetzel, Stamenov, & Dhingra (2016) assessed the potential impact of automation and AI technologies on the global workforce and explore strategies for managing the transition to a digital economy. Drawing on insights from industry experts, economic analysis, and case studies, the authors developed scenarios to examine the implications of automation and AI for employment trends, skill requirements, and income distribution across different regions and sectors. The study identified significant opportunities for automation and AI to drive productivity gains, economic growth, and job creation. However, it also highlighted challenges related to job displacement, skills mismatches, and income inequality, particularly in low- and middle-income countries. The authors recommended a holistic approach to managing the transition to a digital economy, including investments in education and training, support for displaced workers, and proactive policies to ensure inclusive growth and social cohesion.

Autor & Dorn (2013) investigated the impact of technological advancements, particularly automation and computerization, on employment and wage patterns in the United States. Using data from the Current Population Survey and other sources, the authors employed regression analysis and difference-in-differences techniques to assess the relationship between technological change and employment outcomes across various industries and occupations. The study found evidence of significant job polarization, with employment growth concentrated in high-skill and low-skill occupations, while middle-skill occupations experienced relative decline. Moreover, technological advancements were associated with wage disparities, with high-skilled workers benefiting disproportionately from automation and computerization. The authors recommended policies aimed at promoting skill development, education, and training programs to address the challenges posed by technological change and mitigate income inequality.

3.0 Materials and Methods

Research Setting

This study employed a descriptive survey research design. This design was chosen because it allows for the collection of comprehensive data from a sample representative of the population. The study was conducted in Anambra State, located in the southeastern region of Nigeria. The population for this study includes all employees and employers in the Anambra State labor market. According to the National Population Commission of Nigeria (2020), the estimated population of Anambra State is approximately 5 million people. For the purpose of this study, we focused on the working-age population, estimated to be around 60% of the total population, resulting in a population size of 2 million population (2,256,435) according to recent data from National Bureau of Statistics (2020).

Sample and Sampling Technique

The sample size was determined using the Yamane formula for sample size calculation with a 95% confidence level and a 5% margin of error. Therefore, the sample size of 400 respondents was selected for this study. Stratified random sampling was used to ensure representation across various sectors with the labour market.

Instrumentation and Administration

The primary instrument for data collection is a structured questionnaire. The questionnaire is divided into two sections: Part A contains questions related to the descriptive details of the study. Part B consists of open-ended questions that respondents answered using a 4-point Likert scale ranging from 4 – Strongly Agreed (SA), 3 – Agreed (A), 2 – Disagree (D) and 1 – Strongly Disagreed (SD) respectively. The questionnaire was subjected to both content and face validation. Experts in the field of labor economics and industrial relations reviewed the questionnaire items to ensure that it adequately covers the research questions and objectives. A pilot study was conducted with 40 respondents (10% of the sample size) to refine the questions for clarity and relevance. The Cronbach's alpha coefficient is used to test the reliability of the questionnaire. A reliability coefficient of 0.73 is obtained, indicating that the instrument consistently measures the concepts of interest. The questionnaires were administered in-person by trained research assistants. This approach ensures a high response rate and allows the research assistants to provide clarification if needed. The administration was done across different sectors and geographical locations within Anambra State to ensure a representative sample.

Method of Data Analysis

Descriptive and inferential statistics were used to analyse the data that was collected. The data is summarised using descriptive statistics including percentages, averages, and standard deviations, as well as frequencies. The hypotheses were tested using inferential statistics, such as Pearson's correlation, at a significance level of 0.05. The statistical software SPSS (Statistical Package for the Social Sciences) version 25.0 is used for data analysis.

4.0 Analysis and Result

4.1 Demographic Information of the Respondents

The demographic information of the respondents was analyzed in order to get the frequencies and percentages. Table 1 below shows the demographic information of the respondents.

Table 1: Demographic information of the respondents

Information (%)	Frequency	Percent
Age:		
18-25	80	20%
26-35	120	30%
36-45	100	25%
46-55	60	15%
56-65	30	7.5%
66 and above	10	2.5%
Gender:		
Male	200	50%
Female	200	50%
Education Level:		
No formal education	20	5%
Primary education	40	10%
Secondary education	100	25%
Vocational/Technical education	60	15%
Bachelor's degree	120	30%
Master's degree	40	10%
Doctorate	10	2.5%
Other	10	2.5%
Employment Status:		
Employed full-time	160	40%
Employed part-time	60	15%
Self-employed	80	20%
Unemployed	40	10%
Student	40	10%
Retired	10	2.5%
Other	10	2.5%

Job Sector:

Agriculture	60	15%
Manufacturing	40	10%
Services	120	30%
Information Technology	40	10%
Healthcare	40	10%
Education	60	15%
Government	20	5%
Other	20	5%

Years of Work Experience:

Less than 1 year	40	10%
1-3 years	80	20%
4-6 years	100	25%
7-10 years	100	25%
More than 10 years	80	20%

Type of Employment:

Permanent	200	50%
Contract	80	20%
Temporary	40	10%
Internship	20	5%
Freelance	40	10%
Other	20	5%

Monthly Income Range:

Less than ₦20,000	40	10%
₦20,000 - ₦50,000	80	20%
₦51,000 - ₦100,000	100	25%
₦101,000 - ₦200,000	80	20%
₦201,000 - ₦500,000	60	15%
₦501,000 - ₦1,000,000	20	5%
Above ₦1,000,000	20	5%

Marital Status:

Single	120	30%
Married	200	50%
Divorced	40	10%
Widowed	20	5%
Other	20	5%

Place of Residence:

Urban	200	50%
Semi-Urban	120	30%
Rural	80	20%

Access to Technology:

How frequently do you use the following technologies in your work? (Computer, Internet, Smartphones, etc.)

Never	20	5%
Rarely	40	10%
Sometimes	80	20%
Often	140	35%
Always	120	30%

Total	400	100%
--------------	------------	-------------

Field Survey (2024)

The table 1 presents the demographic profile of respondents who participated in the study across various age groups, genders, and education levels, providing a comprehensive overview of the workforce in Anambra State, Nigeria. The sample is equally divided between males and females, with a significant portion aged 26-35 (30%). Educational attainment is diverse, with the majority holding secondary education (25%) or bachelor's degrees (30%). Employment status varies, with 40% employed full-time and 20% self-employed. Job sectors are also well-represented, particularly in services (30%) and agriculture (15%). Respondents have varied work experience, predominantly over 7 years (50%), and a range of income levels, with 25% earning ₦51,000 - ₦100,000 monthly. Most respondents reside in urban areas (50%) and frequently use technology in their work (65% often or always). This demographic diversity supports the study's aim to assess the socio-economic impacts of technological innovation on employment patterns and job security.

4.2 Answering Research Questions and Hypotheses Testing

Research Question 1

How does technological innovation affect employment patterns in Anambra State?

Table 2: Descriptive Analysis of how does technological innovation affect employment patterns in Anambra State

Variables	N	Arithmetic Mean	Expected Mean	R	Remarks
Employment Patterns	400	15.40	12.5	0.93	Strong Effect
Technological Innovation		17.28	12.5		

Field Survey (2024)

The table 2 presents a descriptive analysis of the impact of technological innovation on employment patterns in Anambra State. The arithmetic mean for employment patterns is 15.40, compared to an expected mean of 12.5, resulting in a ratio (R) of 0.93, which indicates a strong effect. This suggests that technological innovation, with an even higher arithmetic mean of 17.28 against the same expected mean of 12.5, significantly influences employment patterns. The higher than expected means for both variables highlight a substantial positive impact, implying that technological advancements are strongly correlated with changes in employment trends in the region.

Research Question 2

What is the impact of technological innovation on job security in Anambra State labor market?

Table 3: Descriptive Analysis of impact of technological innovation on job security in Anambra State labor market

Variables	N	Arithmetic Mean	Expected Mean	R	Remarks
Job Security	400	13.08	12.5	0.96	Strong Effect
Technological Innovation		17.28	12.5		

Field Survey (2024)

The descriptive analysis in Table 3 evaluates the impact of technological innovation on job security in the labor market of Anambra State. The arithmetic mean for job security is 13.08, surpassing the expected mean of 12.5, yielding a ratio (R) of 0.96, which indicates a strong effect. Similarly, the arithmetic mean for technological innovation is significantly higher at 17.28 compared to the expected mean of 12.5. This suggests that technological innovation positively influences job security, as the higher-than-expected means reflect a strong and favorable impact on maintaining and enhancing job security amidst technological advancements in Anambra State's labor market.

Hypotheses Testing

Research Hypothesis 1

There is no significant relationship between technological innovation and employment patterns in Anambra State.

Table 4: Pearson product moment correlation analysis of the relationship between technological innovation and employment patterns in Anambra State

Variable	ΣX	ΣX^2	ΣXY	r
	ΣY	ΣY^2		
Employment Patterns (X)	2910	47730	172800	0.93*
Technological Innovation (Y)	10440	631710		

*Sig. at 0.05 level; df = 398; N = 400; r crit. = 0.113

The table 4 presents a Pearson product-moment correlation analysis examining the relationship between technological innovation and employment patterns in Anambra State. The data includes the sum of employment patterns (X) at 2910, the sum of their squares (ΣX^2) at 47730, the sum of technological innovation (Y) at 10440, and the sum of their squares (ΣY^2) at 631710. The product of the sums (ΣXY) is 172800. The resulting correlation coefficient (r) is 0.93, which is significant at the 0.05 level with a critical value (r crit.) of 0.113 and degrees of freedom (df) of 398. This indicates a strong positive relationship between technological innovation and employment patterns, suggesting that higher levels of technological innovation are associated with significant changes in employment patterns in Anambra State.

Research Hypothesis 2

There is no significant impact of technological innovation on job security in Anambra State labor market.

Table 5: Pearson product moment correlation analysis of the impact of technological innovation on job security in Anambra State labor market.

Variable	ΣX	ΣX^2	ΣXY	r
	ΣY	ΣY^2		
Job Security (X)	3075	53205	182250	0.961*
Technological Innovation (Y)	10440	631710		

*Sig. at 0.05 level; df = 398; N = 400; r crit. = 0.113

The table 5 presents a Pearson product-moment correlation analysis evaluating the impact of technological innovation on job security within Anambra State's labor market. Job security (X) is represented by a sum of 3075 and a sum of squares ($\sum X^2$) of 53205, while technological innovation (Y) has a sum of 10440 and a sum of squares ($\sum Y^2$) of 631710. The product of the sums ($\sum XY$) is 182250, yielding a correlation coefficient (r) of 0.96. This correlation is statistically significant at the 0.05 level with a critical value (r crit.) of 0.113 and degrees of freedom (df) of 398. The strong positive correlation suggests that technological innovation has a substantial impact on job security in Anambra State's labor market, indicating that higher levels of technological innovation are associated with greater job security concerns.

4.3 Discussion of the Findings

The correlation analyses presented in Tables 2 & 4, and 3 & 5 investigated the relationship between technological innovation and both employment patterns and job security in Anambra State labor market. The findings indicate a strong positive correlation between technological innovation and both employment patterns and job security, suggesting significant socio-economic implications of technological advancement in the region.

Employment Patterns

The correlation coefficient of 0.93 between technological innovation and employment patterns implies a robust positive relationship. This finding aligns with numerous empirical studies conducted globally, including those within Nigeria, highlighting the transformative impact of technology on employment dynamics. For instance, a study by Oluwatobi et al. (2019) explored the effect of technological innovation on employment in Nigeria, emphasizing how advancements in technology lead to changes in labor demand and composition. Similarly, a study by Ajayi and Dada (2018) emphasized the role of technological innovation in shaping employment patterns, especially in emerging economies like Nigeria. Moreover, recent developments in the Nigerian context, such as the integration of digital technologies in various sectors, support the notion of technology-driven changes in employment patterns. The Nigerian Communications Commission (NCC) reported a surge in internet penetration and mobile technology adoption, indicating a shift towards a more technologically driven economy (NCC, 2023). This transition likely contributes to the observed correlation between technological innovation and employment patterns in Anambra State. Similarly, Adesoye and Maku (2019) found a similar positive relationship between technological innovation and employment dynamics in Nigerian industries. Moreover, research by Adeoti and Olawale (2017) highlighted the transformative impact of technological innovation on employment structures in Nigeria's manufacturing sector, emphasizing the need for adaptive policies to mitigate potential disruptions.

Job Security

The correlation coefficient of 0.96 between technological innovation and job security underscores the significant impact of technological advancement on employment stability within Anambra State's labor market. This finding echo broader research on the relationship between technology and job security, emphasizing how automation and digitalization influence the nature of work and employment stability (Adeoti et al., 2022). Nigerian scholars have also recognized the importance of addressing job security concerns amid rapid technological changes (Olaniyan & Akande, 2021). Furthermore, recent policy initiatives in Nigeria aimed

at promoting digital literacy and entrepreneurship reflect efforts to mitigate the potential negative effects of technological innovation on job security. The National Information Technology Development Agency (NITDA) launched various programs to equip Nigerians with digital skills and foster innovation-driven entrepreneurship, signaling a proactive approach to addressing job security challenges in the digital era (NITDA, 2023). Moreover, Afolabi and Adegbite (2020) emphasized the need for proactive measures to address potential job displacement resulting from technological advancements in Nigeria's labor market. Additionally, Brynjolfsson and McAfee (2014) examined the concept of technological unemployment, whereby advancements in automation and artificial intelligence lead to structural shifts in labor markets, potentially exacerbating inequalities and insecurity. Acemoglu and Restrepo (2019), on the other hand highlighted the dual effects of automation on employment, where certain industries experience job losses while others witness job creation.

Conclusion

In conclusion, this study examines the impact of technological innovation on employment patterns, and job security within the labor market of Anambra State. Through rigorous analysis and examination of pertinent literature, it becomes evident that technological advancements have profound socio-economic implications, reshaping not only the nature of work but also the stability of employment opportunities. The findings reveal a robust positive correlation between technological innovation and both employment patterns and job security, revealing the transformative impact of technology on the labor force of Anambra State. However, this transformation is not without its challenges. While technological innovation presents opportunities for increased productivity and economic growth, it also poses risks of job displacement and skill mismatches, particularly for certain segments of the workforce.

Recommendations

Based on the findings of the study several recommendations emerge to address the identified challenges and harness the opportunities presented by technological advancement:

1. Anambra State government should explore diversification strategies to reduce reliance on sectors vulnerable to technological disruption. This could involve promoting industries with high growth potential, such as renewable energy, healthcare, and tourism.
2. There is a need for strategic investment in education and training programs to equip the workforce with the skills required in the digital economy. This includes promoting STEM (Science, Technology, Engineering, and Mathematics) education and fostering lifelong learning opportunities to adapt to changing job requirements.
3. Policies should be implemented to support workers who may be displaced by technological innovation. This could involve providing retraining programs, financial assistance, and career counseling to facilitate their transition to new employment opportunities.
4. Encouraging entrepreneurship and innovation can stimulate job creation and economic growth. Initiatives such as startup incubators, access to funding, and supportive regulatory frameworks can foster a culture of innovation and entrepreneurship within the state.

REFERENCES

- Acemoglu, D. & Autor, D. (2011). Skill, Tasks and Technologies: Implications for Employment Earnings. In O. Ashenfelter and D. Card (eds.), *The Handbook of Labor Economics*. vol. 4b. Amsterdam: Elsevier.
- Acemoglu, D., & Restrepo, P. (2019). Automation and new tasks: How technology displaces and reinstates labor. *Journal of Economic Perspectives*, 33(2), 3-30.
- Adeoti, A. I., Odusola, A. F., & Akinboade, O. A. (2022). Technology and job security in Nigeria: Issues, challenges and prospects. *Journal of Economics and Sustainable Development*, 13(1), 83-95.
- Adeoti, J. O., & Olawale, F. O. (2017). The Impact of Technological Innovation on Employment Structures in the Manufacturing Sector of Nigeria. *Journal of Innovation Economics & Management*, 24(3), 41-62.
- Adesoye, A. B., & Maku, O. E. (2019). Technological Innovation and Employment Dynamics in Nigerian Industries: An Empirical Analysis. *African Development Review*, 31(3), 345-357.
- Afolabi, S. M., & Adegbite, O. (2020). Automation, Digitalization, and Employment Stability: Evidence from Nigeria's Labor Market. *Nigerian Journal of Economic Studies*, 66(2), 217-234.
- Ajayi, R. A., & Dada, O. (2018). Technological innovation and employment: Evidence from Nigeria. *African Journal of Science, Technology, Innovation and Development*, 10(5), 557-565.
- Autor, D. H. (2015). Why Are There Still So Many Jobs? The History and Future of Workplace Automation. *Journal of Economic Perspectives*, 29(3), 3-30.
- Autor, D. H., & Dorn, D. (2013). The growth of low-skill service jobs and the polarization of the US labor market. *American Economic Review*, 103(5), 1553-1597.
- Autor, D. H., Dorn, D., & Hanson, G. H. (2020). The China Shock: Learning from Labor-Market Adjustment to Large Changes in Trade. *Annual Review of Economics*, 12, 1-39.
- Autor, D. H., Levy, F., & Murnane, R. J. (2013). The Skill Content of Recent Technological Change: An Empirical Exploration. *Quarterly Journal of Economics*, 118(4), 1279-1333.
- Berg, J., Furrer, M., Harmon, E., Rani, U., & Silberman, M. S. (2018). *Digital Labour Platforms and the Future of Work: Towards Decent Work in the Online World*. International Labour Organization.
- Bessen, J. (2019). *AI and Jobs: The Role of Demand*. NBER Working Paper No. 24235.
- Bloom, D. E., Canning, D., & Sevilla, J. (2014). The Effect of Health on Economic Growth: A Production Function Approach. *World Development*, 32(1), 1-13.
- Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. W. W. Norton & Company.

- Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. W.W. Norton & Company.
- Bughin, J., Hazan, E., Ramaswamy, S., Chui, M., Allas, T., Dahlström, P., ... & Henke, N. (2018). *Skill shift: Automation and the future of the workforce*. McKinsey Global Institute.
- Chennells, L. & Van Reenen, J. (1999). *Has Technology Hurt Less Skilled Workers? An Econometric Survey of the Effects of Technical Change on the Structure of Pay and Jobs*, IFS Working Paper No. W99/27
- De Stefano, V. (2016). The Rise of the "Just-in-Time Workforce": On-Demand Work, Crowdfork, and Labour Protection in the Gig-Economy. *Comparative Labor Law & Policy Journal*, 37(3), 471-504.
- Dengler, K., Matthes, B., & Paulus, W. (2018). Occupational tasks across the wage distribution: Implications for employment polarization in Germany. *Work and Occupations*, 45(2), 202-230.
- Frey, C. B., & Osborne, M. A. (2017). The Future of Employment: How Susceptible Are Jobs to Computerization? *Technological Forecasting and Social Change*, 114, 254-280.
- Goldin, C., & Katz, L. F. (2008). *The Race Between Education and Technology*. Harvard University Press.
- Goos, M., Arntz, M., Zierahn, U., Gregory, T., Carretero Gómez, S., González Vázquez, I., Jonkers, K. (2019). *The Impact of Technological Innovation on the Future of Work*. European Commission, Seville, JRC117212.
- International Labour Organization (ILO). (2018). *World Employment and Social Outlook: Trends 2018*. International Labour Office.
- Lima, Y., Barbosa, C.E., dos Santos, H.S., & de Souza, J.M. (2021). Understanding Technological Unemployment: A Review of Causes, Consequences, and Solutions. *Societies* 2021, 11, 50.
- Manyika, J., Lund, S., Chui, M., Bughin, J., Woetzel, J., Batra, P., Ko, R., & Sanghvi, S. (2017). *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation*. McKinsey Global Institute.
- McKinsey Global Institute (2019). *The Future of Work in America*.
- Mokyr, J. (2018). *A Culture of Growth: The Origins of the Modern Economy*. Princeton University Press.
- Moretti, E. (2012). *The New Geography of Jobs*. Houghton Mifflin Harcourt.
- National Information Technology Development Agency. (2023). *Annual Report 2022*. Abuja, Nigeria: NITDA.
- Nigerian Communications Commission. (2023). *Quarterly Statistical Report Q3 2023*. Abuja, Nigeria: NCC.

- Olaniyan, D. A., & Akande, J. (2021). Addressing job security concerns in the era of technological innovation in Nigeria. *International Journal of Advanced Research in Management and Social Sciences*, 10(1), 78-88.
- Oluwatobi, S., Adeniyi, O., & Ogunrinola, I. (2019). The effect of technological innovation on employment in Nigeria: Evidence from ARDL bound testing approach. *Journal of Innovation and Entrepreneurship*, 8(1), 1-20.
- Ra, S., Shrestha, U., Khatiwada, S., Yoon, S. W., & Kwon, K. (2019). The rise of technology and impact on skills. *International Journal of Training Research*, 17(sup1), 26–40.
- Standing, G. (2011). *The Precariat: The New Dangerous Class*. Bloomsbury Academic.
- Standing, G. (2014). *The Precariat Charter: From Denizens to Citizens*. Bloomsbury Academic.
- United Nations Educational, Scientific and Cultural Organization (UNESCO). (2021). *Women in STEM*.
- World Economic Forum. (2018). *The Future of Jobs Report*. World Economic Forum.