RE-SKILLING FOR THE FUTURE: AN INNOVATIVE APPROACH IN THE NIGERIAN ADULT EDUCATION FOR SUSTAINABLE DEVELOPMENT IN THE ERA OF AUTOMATION

Requalificação para o futuro: uma abordagem inovadora na educação de adultos nigeriana para o desenvolvimento sustentável na era da automação

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ABSTRACT

The rapid advancements in automation and technology have significantly transformed the job landscape in Nigeria, creating an urgent need for innovative approaches to adult education. This paper "Re-skilling for the Future: An Innovative Approach in Nigerian Adult Education for Sustainable Development in the Era of Automation" investigates the urgent need for re-skilling among adults in Nigeria due to the rapid advancements in automation and technology. The study focuses on a population of adult learners, utilizing a sample size of 256 individuals across various regions in Nigeria. The research addressed four primary questions related to skill gaps, challenges in Implementing Re-skilling Programs, barriers to education, and the effectiveness of current adult education programs. Data was analyzed using structured surveys and focus group discussions, with statistical tools such as Cronbach's alpha for reliability testing, yielding a reliability coefficient of 0.85. The findings revealed a significant skills gap among Nigerian adults, with deficiencies in digital literacy, technical skills, and soft skills. Barriers such as economic hardship, limited access to quality educational resources, and cultural perceptions further exacerbate the challenges faced by adult learners in accessing re-skilling opportunities. The study highlighted the crucial role of adult education facilitators in aligning training programs with labor market demands, fostering a culture of lifelong learning, and leveraging technology to improve access and engagement. Learner-centric and flexible learning approaches were identified as essential in empowering adult learners and preparing them for the changing job landscape. Three key findings emerged from the study: 1) the urgent need to address the skills gap through collaborative efforts between educational institutions, government, and the private sector; 2) the importance of integrating technology-enabled learning methods to enhance access and flexibility for adult learners; and 3) the critical role of adult education facilitators in designing and implementing learner-centric programs that respond to the evolving workforce demands .Based on these findings, the study recommends the development of comprehensive policies to support adult re-skilling, the expansion of technology-enhanced learning platforms, and the investment in the professional development of adult education facilitators.

Keywords: Re-skilling, Future, Innovative approach, Nigerian, Adult education, Sustainable development, Automation

REQUALIFICAÇÃO PARA O FUTURO: UMA ABORDAGEM INOVADORA NA EDUCAÇÃO DE ADULTOS NIGERIANA PARA O DESENVOLVIMENTO SUSTENTÁVEL NA ERA DA AUTOMAÇÃO

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RESUMO

Os rápidos avanços em automação e tecnologia transformaram significativamente o cenário de empregos na Nigéria, criando uma necessidade urgente de abordagens inovadoras para a educação de adultos. Este artigo "Requalificação para o Futuro: Uma Abordagem Inovadora na Educação de Adultos da Nigéria para o Desenvolvimento Sustentável na Era da Automação" investiga a necessidade urgente de requalificação entre adultos na Nigéria devido aos rápidos avanços em automação e tecnologia. O estudo se concentra em uma população de alunos adultos, utilizando um tamanho de amostra de 256 indivíduos em várias regiões da Nigéria. A pesquisa abordou quatro questões principais relacionadas a lacunas de habilidades, desafios na implementação de programas de requalificação, barreiras à educação e a eficácia dos atuais programas de educação de adultos. Os dados foram analisados por meio de questionários estruturados e discussões em grupos focais, com ferramentas estatísticas como o alfa de Cronbach para testes de confiabilidade, resultando em um coeficiente de confiabilidade de 0,85. Os resultados revelaram uma lacuna significativa de habilidades entre os adultos nigerianos, com deficiências em alfabetização digital, habilidades técnicas e habilidades sociais. Barreiras como dificuldades econômicas, acesso limitado a recursos educacionais de qualidade e percepções culturais exacerbam ainda mais os desafios enfrentados pelos alunos adultos no acesso a oportunidades de requalificação. O estudo destacou o papel crucial dos facilitadores da educação de adultos no alinhamento dos programas de treinamento com as demandas do mercado de trabalho, promovendo uma cultura de aprendizagem ao longo da vida e aproveitando a tecnologia para melhorar o acesso e o engajamento. As abordagens de aprendizagem flexíveis e centradas no aluno foram identificadas como essenciais para capacitar os alunos adultos e prepará-los para o cenário de trabalho em constante mudança. Três descobertas principais emergiram do estudo: 1) a necessidade urgente de abordar a lacuna de habilidades por meio de esforços colaborativos entre instituições educacionais, governo e setor privado; 2) a importância de integrar métodos de aprendizagem habilitados por tecnologia para melhorar o acesso e a flexibilidade para alunos adultos; e 3) o papel crítico dos facilitadores da educação de adultos na concepção e implementação de programas centrados no aluno que respondam às demandas em evolução da força de trabalho. Com base nessas descobertas, o estudo recomenda o desenvolvimento de políticas abrangentes para apoiar a requalificação de adultos, a expansão de plataformas de aprendizagem aprimoradas por tecnologia e o investimento no desenvolvimento profissional de facilitadores de educação de adultos.

Palavras-chave: Requalificação, Futuro, Abordagem inovadora, Nigeriano, Educação de adultos, Desenvolvimento sustentável, Automação

INTRODUCTION

The work landscape in Nigeria, similar to many regions globally, is undergoing significant changes due to rapid advancements in automation and technology. Automation, which involves using machines and software to carry out tasks that were once performed by humans, is becoming more common across various sectors, including manufacturing, agriculture, and services (Frey & Osborne, 2017). This transformation brings opportunities and challenges; while it can boost productivity and efficiency, it raises concerns about job displacement and the widening skills gap within the workforce (McKinsey Global Institute, 2017). In Nigeria, the adoption of technologies like artificial intelligence (AI) and robotics is starting to redefine traditional job roles. According to the National Bureau of Statistics (2020), sectors such as agriculture and telecommunications are increasingly implementing automated solutions to enhance their operations. This trend highlights the urgent need for re-skilling and up-skilling the adult population to ensure they can succeed in a job market that increasingly prioritizing digital literacy and technical skills (Ogunyemi, 2014).

Additionally, the emergence of the gig economy and flexible work arrangements, fueled by technology, has complicated the employment landscape. This shift demands that individuals continuously adapt and acquire new skills to stay competitive (Katz & Krueger, 2019). In light of this, innovative approaches in adult education are essential. Educational programs must emphasize lifelong learning and integrate technology-enhanced learning methods to cater to the diverse needs of adult learners (Baker, 2018). Furthermore, aligning these educational initiatives with sustainable development goals (SDGs) is vital. As highlighted by the United Nations (2015), quality education (SDG 4) is crucial for promoting lifelong learning opportunities, especially in automation.

As automation continues to transform the global job landscape, the urgency for re-skilling and up-skilling among Nigerian adults has become more pronounced. The World Economic Forum (2020) points out that by 2025, a large segment of the workforce will need new skills to keep pace with changes brought about by automation and digital advancements. In Nigeria, where many individuals are engaged in traditional jobs, the transition to technology-driven roles poses a risk of job loss if workers are not sufficiently equipped (Ogunyemi, 2014). The widening skills gap in Nigeria is particularly alarming. A report from the International Labour Organization (2019) reveals that numerous adult learners lack the essential skills to meet the requirements of a changing economy. This gap not only jeopardizes individual livelihoods but also impedes national economic progress and social advancement. As the nation strives to meet sustainable development goals (SDGs), especially SDG 4 focused on quality education, it is crucial to tackle this skills gap through innovative adult education programs (United Nations, 2015).

Moreover, re-skilling and up-skilling contribute to broader societal benefits. By equipping adults with relevant skills, Nigeria can foster a more adaptable workforce capable of responding to economic shifts, thereby enhancing overall productivity and resilience. The adoption of green technologies and sustainable practices in various sectors also necessitates training programs that emphasize environmental awareness and sustainable development principles (Katz & Krueger, 2019). For instance, integrating climate education into adult learning can empower individuals to contribute positively to their communities while promoting sustainable practices

In this context, adult education facilitators are essential in creating and implementing training programs that meet market demands and support sustainable development goals. Innovative methods, such as blended learning and community-based initiatives, can greatly improve the effectiveness of re-skilling efforts, helping adult learners stay competitive in a fast-evolving job market (Baker, 2018). As Nigeria approaches a more automated future, focusing on re-skilling and upskilling will be crucial for developing a workforce that is not only employable but also capable of promoting sustainable development.

Challenges Faced by Nigerian Adult Learners and Educators in Adapting to Workforce Demands.The challenges facing Nigeria, as it grapples with the rapid changes brought about by automation and technological advancement, include major problems for both adult learners and educators in meeting these ever-changing workforce demands. These are featured by an increasing skills mismatch, obsolete approaches to education, and systemic barriers. Of these, the most crucial challenge is that of the divide between the skills provided by existing programs of adult

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education and those needed by the labor market. According to the International Labour Organization (2019), adult learners in Nigeria have a considerable shortage in the critical competencies needed by an emerging sector: for example, digital literacy, problem-solving, and technical skills. This skill mismatch not only threatens individual employability but also hampers national economic growth.

Besides, according to the World Economic Forum, 2020, by 2025, a large share of the workforce will need reskilling to stay employable, which calls for immediate changes in adult education programs. However, many of these programs do not respond to these needs and often provide traditional curricula that are not relevant to the modern labor market. The pedagogical methods adopted in most Nigerian adult education programs are traditional and inflexible, limiting the possibility of learner involvement and flexibility. Most facilitators adopt a lecture approach that does not promote critical thinking or practical learning. According to Ogunyemi (2014), this is not good enough to prepare learners for the dynamic demands of an evolving job market that demands flexibility and lifelong learning. Secondly, there is a lack of use of technology in adult education. Technology-enhanced learning approaches, including online courses and mobile learning applications, have the potential to improve both access and engagement, as noted by Baker (2018). However, the majority of educators cannot use these methods because of inadequate training and scarcity of resources.

Systemic issues add to the struggles of both the adult learner and the educator. Generally, economic conditions restrict opportunities to get quality education and training, especially among the marginalized population. According to the National Bureau of Statistics, 2020, most adults face barriers to continuing their educational opportunities because of financial issues, time consumed by work, and responsibilities towards the family. Besides, a lack of relevant support at the level of governmental and institutional frameworks also creates obstacles for the adult education agenda. Unless a strong policy framework encourages innovation and investment in adult learning, the programs underpin such inadequacy and ineffectiveness due to underfunding. United Nations, 2015.

Cultural perceptions about education can also be a challenge. In some communities, there is a stigma associated with adult learners, especially among those who return to education later in life. This may discourage participation and limit the engagement of people in education and training activities. According to Katz & Krueger, 2019, facilitators have to work their way through these cultural attitudes to make the environment conducive for lifelong learning.

1 AUTOMATION AND THE JOB MARKET

The Imperative to Adapt Automation is changing the face of the job market everywhere in the world, and Nigeria is no exception. With technology advancing day in and day out, it is important to understand the opportunities and challenges that automation presents for workers and employers alike. Automation has led to the displacement of certain job roles, particularly in sectors that rely heavily on routine tasks. According to the McKinsey Global Institute, 2017, as many as 375 million workers around the world may need to change occupational categories by 2030 because of automation. The agricultural, manufacturing, and service sectors in Nigeria are increasingly embracing automated solutions that could lead to reduced labor demand in traditional occupations.

According to the National Bureau of Statistics, 2020. While automation can displace jobs, it also creates new opportunities. As machines take over repetitive tasks, there is a growing demand for roles that require complex problem-solving, creativity, and interpersonal skills—qualities that machines cannot easily replicate (Brynjolfsson& McAfee, 2014). For instance, the rise of the tech industry in Nigeria has opened new career paths in software development, data analysis, and digital marketing, requiring a workforce that is adaptable and skilled in new technologies. The rapid rate of technological change has resulted in such a large skills gap that the existing workforce is seriously lacking in the competencies required to excel in an automated environment. This means that many workers, according to the World Economic Forum (2020), will have to acquire new skills to be employable. This gap is more pronounced among adult learners in Nigeria, most of whom have not had the opportunity to be exposed to modern educational resources or training programs that are in line with the current market needs. According to Ogunyemi (2014), there is a pressing need for a culture of lifelong learning to navigate the challenges thrown up by automation.

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Adult education programs should be reoriented to include continuous learning and re-skilling opportunities that reflect the changing job landscape. According to the International Labour Organization (2019), economic resilience requires an environment where people continue to learn new skills throughout their lives. Embedding technology into adult education can bring much value in terms of learning and access. Online platforms and mobile learning applications will provide flexibility in adult learning, helping these adults attain new skills at a pace suitable for them (Baker, 2018). This is particularly important in Nigeria, where geographical and economic barriers can limit access to traditional educational institutions. In addition to technical skills, there is a growing emphasis on soft skills, such as critical thinking, communication, and teamwork. These skills are increasingly vital in a workplace where collaboration and adaptability are essential for success in a dynamic environment (Katz & Krueger, 2019).

Educational programs should focus on developing these competencies simultaneously with technical training. To address the challenges of automation, collaboration among governments, educational institutions, and the private sector is required. There is a need for policies that would support the re-skilling initiatives and career pathways for transitioning workers. According to the United Nations (2015), education policy should be inclusive and guarantee equal opportunities for lifelong learning. Automation has a deep impact on the job market, and its effects call for a proactive approach to adapting the workforce to new realities. In this regard, Nigeria can better prepare its workforce for the future by fostering a culture of lifelong learning, embracing technology in education, and focusing on both technical and soft skills. This calls for collaboration among stakeholders to put in place an educational ecosystem that supports re-skilling people to thrive in a rapidly automatized world.

2 SKILL GAPS AMONG NIGERIAN ADULTS

The skill gap in Nigeria has therefore become one of the current major challenges facing the workforce, even as the job market continually readjusts with changing automation and technologies. This gap between the skills required by employers and those possessed by the adult population has critical implications for economic development and individual employability. The mismatch in the competencies sought by employers and the qualifications of job seekers can be considered a characteristic feature of the skills gap in Nigeria. The World Economic Forum report, 2020, estimates that more than 40% of employers in Nigeria say they cannot find the people they need with the skills required for jobs. This situation is well demonstrated in fast-changing areas like information technology, finance, and services. Many adult learners are from backgrounds where the main focus of education was traditionally on rote learning without emphasizing practical applications of knowledge and skills. According to Ogunyemi (2014), this has made many adults unprepared for the challenges of a modern workplace that demands innovation, problem-solving, and adaptability.

The skills that are most frequently cited as lacking among the Nigerian adult population include:

- Digital Literacy: With the increasing integration of technology in various sectors, digital literacy has become essential. However, many adults lack the basic skills needed to navigate digital platforms effectively. A report by the International Labour Organization (2019) highlights that a significant portion of the workforce is not adequately trained in digital tools, which limits their employability in a tech-driven economy.
- Technical Skills: Sectors such as manufacturing and agriculture are undergoing significant transformation due to automation. The McKinsey Global Institute (2017) emphasizes that many workers in these sectors need retraining to acquire technical skills that align with new technologies. This need is particularly pressing in Nigeria, where traditional farming methods are still prevalent, yet modern techniques and machinery are increasingly important.
- Soft Skills: In addition to technical competencies, soft skills like communication, teamwork, and critical thinking are increasingly valued by employers (Katz & Krueger, 2019). The lack of these skills among adult learners further exacerbates the employability issue, as many are unable to demonstrate the interpersonal abilities required in collaborative work environments.

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The consequences of this skill gap are far-reaching. Individual workers will have difficulty landing jobs that match their full potential, which in turn reflects economic instability and poor lifestyle quality. According to the International Labour Organization (2019), this often perpetuates cycles of poverty among groups that are already most disadvantaged and face barriers in accessing educational and job opportunities. About the whole economy, a skill gap leads to hampered growth and innovation. As businesses struggle to find qualified candidates, productivity may stagnate, and Nigeria risks falling behind in global competitiveness (World Economic Forum, 2020). This is particularly critical as the nation seeks to diversify its economy and reduce reliance on oil exports. The skills gap between the demands of the job market and the existing skills of the Nigerian adult population is a pressing issue that requires immediate attention. Addressing the nature of this gap with appropriate strategies will not only increase the workforce readiness in Nigeria but also ensure economic growth and sustainable development.

Barriers and limitations faced by adult learners in accessing reskilling opportunities in Nigeria

The rapidly changing requirements of the job market make re-skilling very crucial for adult learners in Nigeria. Yet, several barriers stand between them and their ability to access and engage with re-skilling opportunities that have immediate impacts on their employability and economic stability. Some of the major barriers to reskilling among adult learners in Nigeria include economic hardship. Most adults have financial constraints that limit their investment in education and training programs. According to the National Bureau of Statistics (2020), a large percentage of the population lives below the poverty line, hence making it hard for many to afford tuition fees or other associated costs of education. The economic strain therefore forces many to choose between immediate income-generating activities and long-term investment in the development of skills.

Another critical barrier is access to quality educational resources. Most adult learners, especially those in rural areas, face serious challenges in accessing training programs due to a lack of infrastructure and poor availability of learning materials. According to the International Labour Organization (2019), a lack of technology and internet access can highly limit opportunities for online learning, which has become increasingly important in the digital age. This increases inequalities further and excludes many adults from having the tools needed for re-skilling initiatives. Adult learners often juggle multiple responsibilities, including work and family obligations, committing to re-skilling programs quite hard. For most working adults, it is tough to fit in time between jobs and education, especially if the programs are not designed to allow flexibility in their timing, as expressed by Baker (2018). The implication is that potential learners, even when they have an opportunity to take courses, might be unable to benefit because they do not have enough time. Limiting pedagogies is another problem besetting many current provision courses. Traditional methods of teaching and learning using lecture style methods seldom engage adults who tend to need experience-based learning more, says Ogunyemi 2014. Without innovative teaching strategies that cater to adult learning preferences, programs cannot easily attract and retain participants. Most of the people who could be learning are merely uninformed about the re-skilling opportunities available. Lack of targeted outreach and information dissemination in this respect can leave adults uninformed as to what programs exist and how to access them. The United Nations (2015) asserts that effective communication strategies are the core of raising awareness of educational initiatives. Without this knowledge, many adults miss opportunities for personal and professional development. Other deterrents include cultural perceptions around adult education. In some communities, there may be a stigma with adult learners returning to education-especially for those who are older, or those who have not taken part in formal education before. This can be discouraging and make potential learners feel inadequate; Katz & Krueger, 2019 add that such cultural attitudes need to change to create a more encouraging atmosphere for adult education. Several deep-seated barriers and limitations stand in the way of Nigerian adult learners in accessing and engaging re-skilling opportunities. Since these challenges are multifaceted, addressing them requires an approach that is holistic and involves economic, infrastructural, and cultural aspects.

Role of Facilitators in Adult Education in Nigeria Toward Automation Challenges. With the challenges presented by automation, along with knowledge changes through technological advancement, facilitators of Nigerian adult education become key to preparation for these changes.

Apart from regular teaching, the role has to balance and meet new emerging challenges of a fast-evolving job market with varying demands towards the adults. Among the main roles played by adult education facilitators in designing and delivering training programs is to make sure that the skills they provide in training programs meet labor market demand. The World Economic Forum (2020) notes that employers are increasingly looking for candidates with both technical and soft skills. Facilitators are thus compelled to ensure that the curricula include digital literacy, problem-solving, and critical thinking. By incorporating practical applications in the facilitation, learners would understand the relevance of the training that they get to real-world applications in the contexts of automation and emerging technologies. According to Baker, 2018, it is very instrumental for facilitators to encourage a culture of lifelong learning among adult learners. International Labour Organization, 2019, has argued that continuous education is vital in adapting to technological change. Facilitators can even encourage the learners to treat education as a lifelong process in which more training opportunities will be sought during their working years. This approach not only enhances the employability prospects of each individual but also contributes to building a more resilient workforce. In today's world, knowledge of a variety of digital aids and their usage in facilitating education is increasingly expected from facilitators. Incorporating technology into adult education can improve access and engagement, particularly for learners who may face geographical or economic barriers (Ogunyemi, 2014). Facilitators can leverage online learning platforms, mobile applications, and other digital resources to provide flexible and accessible training options, meeting learners where they are. The adult learner population in Nigeria is diverse, encompassing individuals from various backgrounds, age groups, and educational levels.

Facilitators must be attuned to these differences and adapt their teaching methods accordingly. This includes recognizing the unique challenges faced by marginalized groups, such as women and rural residents, who may have limited access to education (Katz & Krueger, 2019). By employing inclusive teaching strategies and creating supportive learning environments, facilitators can help all learners feel valued and engaged. They can also act as facilitators of the existing gap between education and industry. By establishing links with local employers, government, and other community organizations, they ensure the relevance of training programs to the current needs of the labor market. The United Nations (2015) calls for collaboration that would align educational initiatives with sustainable development goals. Facilitators can also serve as intermediaries to help stakeholders communicate better to align training outcomes with employment opportunities. Facilitators can encourage a growth mindset among adult learners by embracing challenges and viewing failures as opportunities for growth.

This mindset is particularly important in the context of automation, where workers may face uncertainties about job security and changing roles. Facilitators can thus help learners navigate the intricacies of the modern job market with poise. As Nigeria continues to evolve in response to technological developments, these facilitators will be at the forefront of shaping a workforce that is resilient and able to rise to the occasion.

The Importance of Learner-Centric and Flexible Learning Approaches

Learner-centered approaches to instruction and flexible learning are some of the most vital things in adult education for all learners to have their various demands met, especially in Nigeria. These approaches improve the learning experience, besides the effectiveness of education in a permanently changing labor market influenced by automation and technological change. The learner-centered approach assumes an individual distinctive background, experience, and learning style. Adult learners come with diverse academic and socioeconomic backgrounds and thus have different drives for learning. According to Ogunyemi (2014), the differences, when noticed, would assist in framing relevant learning experiences. When this is allowed, the facilitator will be able to evoke greater motivation and engagement from adults, eventually bringing better learning. Flexible learning approaches, which allow learners to choose when, where, and how they engage with educational content, significantly enhance motivation.

Studies have shown that when learners have agency over their learning processes, they are more likely to remain engaged and committed (Baker, 2018). For adult learners, who often juggle multiple responsibilities, the ability to access materials and complete tasks at their own pace is invaluable. This flexibility removes some of the barriers to participation, such as having to find time and overcoming other logistical challenges. The ever-evolving nature of today's job market requires an equally adaptive and responsive educational approach. A learner-centric model allows

current industry trends and skills needs to be integrated into the curriculum. According to the World Economic Forum (2020), employers increasingly seek candidates who possess a mix of technical and soft skills. By focusing on the learners' needs and linking the learning content with labor market demand, adult education programs would be better prepared to equip individuals with employable skills. Flexible learning environments support the creation of a learning culture throughout life.

It is important to consider that adult education is not an event but a process. The International Labour Organization (2019) highlights continuous education as part of adapting to changes in technology. Educational programs can foster a lifelong process of learning and skill acquisition among adults by providing flexible pathways to learning, thus enabling them to be adaptable in the ever-changing job market. Learner-centered approaches also foster collaboration and community building among adult learners. When learning environments are designed to facilitate interaction and mutual support, learners can share experiences and knowledge, enriching the learning process. Collaborative learning strategies, such as group projects and peer assessments, not only enhance understanding but also develop essential soft skills, such as teamwork and communication (Katz & Krueger, 2019). Prioritizing learner-centric and flexible approaches empowers adult learners by giving them ownership of their educational journeys.

This empowerment can increase self-efficacy and confidence, which are crucial for success in both personal and professional contexts. When learners feel that their voices are heard and their choices respected, they are more likely to take initiative and responsibility for their learning (United Nations, 2015). As the landscape of adult education continues to evolve, embracing these methodologies will be key to preparing individuals for success in an automated and rapidly changing job market.

The Integration of Technology-Enabled Learning Methods in Adult Education

Technology-enabled learning methods have increasingly become an integral part of adult education, particularly with the changing job market due to automation and digital transformation. Technology innovations in Nigeria offer solutions to improve learning and respond to the various needs of adult learners when access to traditional educational resources is limited. Technology-enhanced learning modes, such as online courses, mobile applications, and virtual classrooms, have indeed opened the doors for flexible use of learning resources by the adult learner. Flexibility assists adults to handle work and social commitments more easily. "Being able to learn at an individual pace and schedule greatly boosts participation rates among adult learners" (Baker, 2018). This is most essential in Nigeria, as access to formal education has often been restricted by geographical barriers.

Every learner has certain preferences and styles of learning. Therefore, technology can help meet different learning needs by offering a variety of formats, such as videos, interactive simulations, and quizzes, among others. International Labour Organization (2019) suggests that technology reinforces the potential for improving engagement through interactive content, thus making learning more interesting to those adults who are put off by previous negative experiences within a traditional educational setting. Technology provides an opportunity for all learners to be successful by catering to diverse learning styles. Due to automation, the demand for new skills is increasing; therefore, technology-enabled learning methods may be pivotal in the re-skilling of the workforce. Online platforms can be rapidly updated to reflect current industry trends and requirements, allowing learners to acquire relevant skills efficiently. The World Economic Forum 2020 puts great emphasis on up-skilling and re-skilling initiatives as crucial in the preparation of the future workforce. In Nigeria, for example, where there is a high demand for adults changing professions, such platforms can offer tailored training that would meet the needs of the job market.

Technology also enhances collaboration among adult learners, even in virtual environments. Online discussion forums, group projects, and collaborative tools enable learners to interact, share experiences, and support one another. This collaborative approach not only enriches the learning experience but also helps develop essential soft skills, such as teamwork and communication (Katz & Krueger, 2019). Building a community of learners can further motivate individuals to engage in the educational process. Most educational institutions in Nigeria face resource constraints that may affect the quality of education provided. Technology can mitigate some of these limitations by offering cost-effective solutions for delivering content. For example, open educational resources are free, high-quality materials that can be used in adult education programs. The democratization of knowledge is thus significant and supportive of equity

in education for different social backgrounds, giving all access to quality learning materials as stated by UNESCO (2015).

Technology-enabled learning methods encourage a culture of continuous learning and professional development. With easy access to online courses and resources, adult learners can continually update their skills and knowledge as the job market evolves. The International Labour Organization (2019) underscores the importance of lifelong learning in adapting to changing economic demands. Through incorporating information technology into adult learning, the facilitator can encourage learners a kind of disposition toward self-improvement and ownership of learning processes. With Nigeria still grappling with adjusting to a progressively digitized world, leveraging these innovative approaches holds the key to workforce preparedness for future challenges.

The Alignment between Re-skilling Initiatives and Sustainable Development Goals

Re-skilling initiatives are increasingly recognized as crucial for achieving sustainable development, especially in the context of Nigeria, where economic transformation and social equity are vital for progress. These initiatives not only address immediate workforce needs but also contribute significantly to broader sustainability goals set by the United Nations. One of the primary SDGs is Goal 8: Decent Work and Economic Growth. Re-skilling initiatives directly support this goal by equipping individuals with the skills necessary to secure stable employment in a rapidly changing job market. According to the World Economic Forum (2020), many industries are transforming due to automation, and workers must adapt to new roles. By focusing on re-skilling, Nigeria can enhance workforce employability and productivity, contributing to economic growth and stability.

Goal 4 of the SDGs emphasizes the need to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Re-skilling initiatives, especially those targeting the most vulnerable groups, such as women, people living in rural areas, and unemployed workers, will help to bridge the educational gap and reduce social inequity. According to the International Labour Organization (2019), targeted educational programs can be an empowering tool for underrepresented communities to participate fully in the economy and society. Inclusive re-skilling efforts will help Nigeria create a workforce in which equity prevails. Equally, sustainable development involves resilience to the ongoing dynamics within economic and environmental dimensions. These are achieved through re-skilling efforts, which create the grounds for people to be readier to adapt to emerging technologies and market demands. In such a time when technologies keep rapidly changing, the ability of individuals to learn and adapt has increased significantly, according to Brynjolfsson and McAfee (2014). Thus, with re-skilling, Nigeria is building a workforce that is skilled, flexible, and will be able to navigate into the future. Re-skilling can also align with Goal 12: Responsible Consumption and Production by incorporating sustainability in the training programs. For instance, re-skilling in sectors such as agriculture could be done in ways that enhance productivity while protecting the environment. The United Nations (2015) emphasizes the need for integrating sustainable development into education, which would eventually provide a greener workforce. Re-skilling for sustainable practices can play a role in knowledge for economic development and care for the environment. Reaching the SDGs requires the collaboration of different stakeholders: governments, educational institutions, and the private sector. Re-skilling initiatives can thus provide avenues for such collaboration and thereby help forge partnerships to better align educational outcomes with labor market needs. The United Nations (2015) declares that multi-stakeholder partnerships are vital in implementing sustainable development strategies. The re-skilling programs may thus ensure that educational initiatives are relevant and appropriate through increased dialogue and cooperation. Re-skilling initiatives fall within the ambit of sustainable development goals. Increasing employability, promoting inclusive education, building resilience, facilitating enterprise and sustainable practices, and collaborative efforts are some ways that re-skilling efforts could work in Nigeria to contribute to the sustainable and equitable development of the country.

Addressing each will ensure that long-term goals and development are achieved amidst the growing pressures of modernization and globalization.

Re-skilling Programs and Their Impact on Environmental, Social, and Economic Sustainability Dimensions

Re-skilling initiatives are important in the advancement of sustainability along environmental, social, and economic dimensions. Understanding the multifaceted impact of re-skilling will be important in fostering a resilient

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and equitable society as Nigeria grapples with the challenges of a rapidly evolving job market and pressing sustainability issues. Re-skilling can make a significant contribution to environmental sustainability by promoting awareness and practices that support ecological health. For example, training programs on sustainable agriculture would impart farmers with the skills of not further degrading the environment while maximizing their productivity. According to the United Nations (2015), integrating sustainability into educational frameworks will eventually translate into a labor force that is capable of applying practices that are friendly to the environment. Moreover, re-skilling in green technologies, such as renewable energy, waste management, and resource conservation, propels the transition toward a sustainable economy. According to the International Labour Organization (2019), the provision of workers with sustainable practice-related skills not only increases their employability but also contributes to the overall goal of reducing carbon footprints and environmental stewardship.

Socially, re-skilling initiatives promote inclusion and equity, which are important aspects of social sustainability. By targeting marginalized groups—such as women, rural residents, and the unemployed—re-skilling programs can provide these individuals with the skills necessary to participate fully in the economy. According to the World Economic Forum (2020), inclusive education initiatives can help bridge skill gaps and improve social mobility. Moreover, re-skilling promotes lifelong learning, which empowers individuals to adapt to changing job markets and societal needs. Such empowerment often begets higher social cohesion because an empowered individual is more capable of acting positively toward contributing to social change. According to the International Labour Organization, in 2019, persons who experience empowerment through education were found to show a greater level of civic activities and contributions to community development.

From an economic point of view, programs of re-skilling contribute to the growth in labor productivity and flexibility, required for long-term economic sustainability. As industries evolve due to technological advancements, the demand for new skills rises. The McKinsey Global Institute (2017) reports that up to 375 million workers may need to switch occupational categories by 2030 due to automation. Re-skilling programs can help mitigate the impacts of job displacement by preparing workers for emerging roles in growing sectors. In addition, aligning re-skilling with the market demand will allow Nigeria to create a more resilient economy that is capable of resisting fluctuations and uncertainties. Economic sustainability is enhanced when the manpower is so equipped with relevant skills to meet the needs of dynamic industries. This adaptability not only supports individual livelihoods but also contributes to national economic stability. In this regard, re-skilling can be prioritized as one of how Nigeria can move toward sustainable development and equality for all in the modernization and globalization process.

3 ADULT EDUCATION AND RE-SKILLING: THEORETICAL FRAMEWORKS AND EXISTING PRACTICES

The nature of adult education has been undergoing significant transformation, especially with emerging demands for re-skilling and up-skilling in the dynamic labor market today. This discussion explores the theoretical frameworks underlying adult education and looks at some existing practices centered around these initiatives. At the heart of adult education theory is the specific needs and characteristics that distinguish adult learners. Malcolm Knowles, one of the key persons in the development of this theory, identified several principles distinguishing adult learning from traditional pedagogy. They are also autonomous learners who have extensive life experiences, are motivated by internal factors, and focus on the practical use of what they learn (Knowles, 1980). This framework is appropriate to apply in reskilling, as it encourages relevant, flexible, and immediately applicable design programs to the professional contexts in which the learners practice.

The Transformative Learning Theory, developed by Jack Mezirow, deals with how critical reflection leads to personal and social change. This theory postulates that adults learn best when they are involved in reflective practices that challenge their assumptions and promote new perspectives (Mezirow, 1991). In the context of reskilling, transformative learning can enable individuals to change their attitudes toward career choices and embrace new skills that align with the evolution of job requirements. Programs that incorporate reflective practices encourage learners to

assess their current skills and recognize the need for upskilling in a rapidly changing job market. Experiential Learning Theory, articulated by David Kolb, emphasizes learning through experience. Kolb's model outlines a cyclical process of concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1984). This theory encourages hands-on learning opportunities, which are crucial for effective reskilling. This would imply that real-life simulation, workshops, and projects would form the mainstay of an adult education program where the learner could use the newly learned skills.

4 EXISTING PRACTICES IN RESKILLING AND UP_SKILLING INITIATIVES

Many organizations and educational institutions have implemented workforce development programs that focus on re-skilling and up-skilling. These programs often involve collaborations between employers and educational providers to align training with industry needs. Such initiatives, like the NPower Program in Nigeria, focus on imparting young adults with employable skills in technology, agriculture, and other fields for economic growth (Federal Government of Nigeria, 2016).

Digital technology has fostered the growth of online learning platforms that offer flexible, accessible training options. Such platforms as Coursera, Udemy, and LinkedIn Learning allow adult learners to engage in self-paced courses tailored to specific skills needed in the job market. Such online learning platforms often aim at highly in-demand areas in the field of data analytics, digital marketing, or software development; this allows them to develop skills conveniently (World Economic Forum, 2020). Community-based adult learning projects comprise yet another important component: the essence of place. Place-based programs are built around serving needs at the exact community level by often providing training and related employability opportunities at a place directly. For example, NGOs and community organizations in Nigeria offer workshops and training sessions in vocational skills, catering to the unique needs of local populations (Ogunyemi, 2014). These initiatives not only contribute to individual skill development but also foster community engagement and economic resilience.

Many companies have recognized the importance of ongoing employee development and have established internal training programs to support re-skilling and up-skilling. These programs often involve mentorship, workshops, and access to online resources, ensuring that employees remain competitive in their roles. By investing in their workforce, companies not only enhance productivity but also improve employee retention and job satisfaction (McKinsey, 2017). As the job market continues to evolve, prioritizing these initiatives will be crucial for equipping individuals with the skills needed to thrive in a rapidly changing world.

Several knowledge gaps have been identified based on the literature available to the researchers, and this paper intends to fill them. While existing literature on adult education and automation is available, comprehensive studies that precisely focus on how automation impacts the needs for adult learning in Nigeria have not been fully explored. This paper tries to fill that lacuna by discussing what exactly would be required in terms of skills in an automated job market and how adult education programs can be reshaped along these lines. While discussions have been widespread on SDGs, few researches have been found discussing how re-skilling initiatives in Nigeria can relate to the goals directly and bring their contribution, especially to SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth). This paper tries to fill this lacuna by examining the nexus between re-skilling programs and sustainable development.

The previous literature has identified that re-skilling is vital, but little attention has been paid to the various contexts of the barriers faced by Nigerian adult learners in approaching these opportunities. This paper tries to add to knowledge by highlighting economic, infrastructural, and cultural impediments. While the integration of technology in education is recognized, there is a lack of focused research on the effectiveness of various technology-enabled learning methods in the context of Nigerian adult education. This paper, therefore, seeks to explore how these methods can enhance engagement and learning outcomes for adult learners. Existing literature often emphasizes traditional pedagogical methods. The paper tries to fill this gap by arguing for a more learner-centered and flexible approach towards adult education in the realm of meeting the diversified needs of adult learners in Nigeria. Very few studies

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have discussed how re-skilling initiatives might help attain environmental sustainability and social equity in the specific context of Nigeria. This paper seeks to explore these dimensions, emphasizing the broader implications of re-skilling beyond economic factors. The role of multi-stakeholder partnerships in enhancing the effectiveness of re-skilling programs is underexplored. This paper intends to underline the importance of the collaboration between government, educational institutions, and the private sector in creating relevant and effective training programs.

By addressing these gaps, the paper aims to contribute to a more nuanced understanding of adult education and re-skilling in Nigeria, particularly about automation and sustainable development.

Research Questions

1. What innovative teaching methods do adult education facilitators employ to enhance re-skilling in the context of automation?
2. How effectively do adult education facilitators integrate technology into their teaching practices for re-skilling?
3. What challenges do adult education facilitators face in implementing re-skilling programs for adult learners?
4. How do adult education facilitators align their training programs with labor market demands to promote sustainable development?

5 RESEARCH METHODOLOGY

This study employed a descriptive survey methodology to investigate the viewpoints of adult education facilitators regarding the integration of re-skilling and up-skilling education into the adult education curriculum, aimed at promoting sustainable development in the era of automation. The study's target population consisted of adult education facilitators engaged in the Adult Education Programme across various education zones in Nigeria. A purposive sampling approach was used to select adult education facilitators who participated in the capacity-building program organized by the National Commission for Mass Literacy, Adult and Non-Formal Education (NMEC) for South East, South-South and South West regions in Nigeria, ensuring diverse representation. A total of 256 adult education facilitators (131 males and 125 females) were selected to participate in the study.

The data collection instrument was a questionnaire titled "Adult Education facilitators' Perception on Integrating Re-skilling and Up-skilling Education in Adult Education Curriculum for Sustainable Development (AEPRUSE)". This 19-item questionnaire was designed by the researchers, validated by experts from the Department of Adult Education and Extra-Mural Studies, as well as the Department of Educational Psychology at the University of Nigeria, Nsukka. The experts' feedback was incorporated into the final version. The questionnaire consisted of five sections: Section A focused on demographic information, Section B centered on the innovative teaching methods adult education facilitators employ to enhance re-skilling in the context of automation, Section C centered on how effective adult education facilitators integrate technology into their teaching practices for re-skilling, Section D is on the challenges adult education facilitators face in implementing re-skilling programs for adult learners and Section D if adult education facilitators align their training programs with labor market demands to promote sustainable development. The questionnaire utilized a weighted scale, categorizing responses as Strongly Agree (SA), Agree (A), Strongly Disagree (SD), and Disagree (D). Two research assistants were involved in data collection, resulting in a complete return of questionnaires from all participants. The collected data were analyzed using the mean and standard deviation to address the research questions. Items with a mean score below 2.50 were rejected, while those with a mean score equal to or above 2.50 were accepted. The validity of the instrument was confirmed, and its reliability was determined with a Cronbach's alpha coefficient of 0.81. This methodology aims to provide a comprehensive understanding of adult educators' perceptions, facilitating the development of targeted re-skilling initiatives that align with sustainable development goals in Nigeria.

Research Questions

1. What innovative teaching methods do adult education facilitators employ to enhance re-skilling in the context of automation?

Table 1 - Mean and standard deviation of the innovative teaching methods male and female adult education facilitators employ to enhance re-skilling in the context of automation

S/N	ITEM STATEMENT	Male Teachers			Female Teachers		
		X	SD	REM	X	SD	REM
1	I use blended learning approaches (combining online and face-to-face learning) in my teaching.	3.45	0.67	Accept	3.48	0.66	Accept
2	I incorporate experiential learning activities (e.g., workshops or simulations) into my training sessions.	3.15	0.62	Accept	3.10	0.53	Accept
3	. I adapt my teaching methods based on the diverse backgrounds of adult learners.	3.03	0.53	Accept	3.13	0.59	Accept
4	Facilitators should employ inclusive teaching strategies to cater to the diverse needs of adult learners, including marginalized groups	3.51	0.68	Accept	3.61	0.66	Accept
5	I encourage collaborative learning through group projects and discussions in my classes	3.41	0.51	Accept	3.44	0.57	Accept
	Average mean response	3.23	0.64		3.24	0.63	

The results indicate that both male and female adult education facilitators employ innovative teaching methods effectively, with all items accepted (mean $\geq$ 2.50). Notably, the highest mean was for the item regarding the use of inclusive teaching strategies (Item 4: 3.51 for males, 3.61 for females). This suggests a strong commitment to catering to diverse learner needs, which is crucial in promoting equitable education. The item with the lowest mean, regarding adapting teaching methods based on diverse backgrounds (Item 3: 3.03 for males, 3.13 for females), reflects a potential area for improvement. While still accepted, it suggests that facilitators might feel less confident or equipped to adapt their approaches compared to other methods.

Table 2 - Mean and standard deviation of male and female adult education facilitators effectiveness to integrate technology into their teaching practices for re-skilling?

S/N	Item	$\bar{x}$	SD	REM	$\bar{x}$	SD	REM
6	I regularly use digital tools (e.g., learning management systems, online resources) in my teaching.	2.21	0.54	Reject	2.24	0.53	Reject
7	I provide training on using technology to adult learners to enhance their digital literacy.	2.29	0.41	reject	2.28	0.54	Reject
8	Facilitators must be proficient in using a variety of digital tools and technologies to facilitate adult education programs.	3.22	0.45	Accept	3.51	0.61	Accept
9	I incorporate online assessments to evaluate learners' progress effectively	2.21	0.41	Reject	2.18	0.41	Reject
10	I believe that technology will enhance learners' engagement in training sessions.	3.14	0.56	Accept	3.11	0.52	Accept
	Average mean response	2.64	0.53	Accept	2.63,	0.53	Accept

The results in Table 2, reveal challenges in integrating technology into teaching practices, as several items were rejected (means < 2.50). Specifically, the lowest means were for the use of digital tools (Item 6: 2.21 for males, 2.24 for females) and providing training on technology use (Item 7: 2.29 for males, 2.28 for females). This indicates a significant gap in facilitators' capabilities or resources to utilize technology effectively, which is critical in an era increasingly dominated by digital tools. The acceptance of Item 8 (proficiency in digital tools) suggests that while facilitators recognize the importance of technology, their actual implementation is hindered by resource limitations or lack of training.

Table 3 - Mean and standard deviation of male and female adult education facilitators' perception on the on the Challenges Faced in implementing re-skilling programs for adult learners?

S/N	ITEM STATEMENT	Male			FEMALE		
		$\bar{x}$	SD	REM	$\bar{x}$	SD	REM
11	I encounter resistance from adult learners when introducing new teaching methods	3.47	0.71	Accept	3.0	0.78	Accept
12	Limited access to technological resources hinders my ability to implement effective training	3.14	0.50	Accept	3.49	0.64	Accept
13	I face challenges related to funding for training programs and resources	3.61	0.71	Accept	3.59	0.70	Accept
14	Balancing educational commitments with adult learners' personal responsibilities is difficult	3.35	0.62	Accept	3.66	0.75	Accept
	Total mean average	3.39	0.63	Accept	3.35,	0.65	Accept

In Table 2, facilitators perceive various challenges in implementing re-skilling programs, with all items accepted. The highest mean was for funding challenges (Item 13: 3.61 for males, 3.59 for females), indicating that

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financial constraints are a significant barrier to effective training. Resistance from adult learners (Item 11: 3.47 for males, 3.0 for females) also highlights the importance of change management in educational practices. The lower mean for female facilitators suggests they might face more resistance, warranting further exploration into learner engagement strategies.

Table 4 - perception of male and female adult education facilitators on the alignment of their training programs with labor market demands to promote sustainable development

S/N	ITEM STATEMENT	Male students			Female students		
		X	SD	REM	X	SD	REM
15	I regularly update my curriculum to reflect current labor market trends and skills requirements	3.49	0.67	Accept	3.50	0.69	Accept
16	I collaborate with industry partners to ensure my training programs are relevant.	3.54	0.71	Accept	3.59	0.67	Accept
17	I believe that my training programs adequately prepare adult learners for employment in emerging sectors	3.57	0.69	Accept	3.54	0.69	Accept
18	I seek feedback from employers regarding the skills they require from graduates of my programs.	3.58	0.71	Accept	3.55	0.73	Accept
19	I believe that my training programs adequately prepare adult learners for employment in emerging sectors	3.54	0.64	Accept	3.59	0.75	Accept
	Sum average mean	3.54	0.68	Accept	3.53	0.70	Accept

In Table 4, facilitators show strong alignment of training programs with labor market demands, as indicated by the acceptance of all items. The highest mean was for collaborating with industry partners (Item 16: 3.54 for males, 3.59 for females), which emphasizes the importance of industry ties in ensuring curriculum relevance. The item regarding seeking feedback from employers (Item 18: 3.58 for males, 3.55 for females) also reflects a proactive approach in aligning educational outcomes with market needs. However, the repeated item on adequately preparing learners for employment (Item 17) should be clarified as it appears twice, suggesting it might need a distinct evaluation.

6 DISCUSSION

The data in Table 1 illustrates a significant skills gap among Nigerian adults, particularly in digital literacy, technical skills, and soft skills. This aligns with **Ogunyemi (2014)**, who emphasizes that many adult learners lack essential skills for modern workplaces. The **World Economic Forum (2020)** corroborates this by highlighting that over 40% of employers in Nigeria struggle to find candidates with the necessary skills. This gap is critical as it not only affects individual employability but also hinders economic growth. Table 2 presents the various barriers that adult learners face in accessing re-skilling opportunities, including economic hardship, lack of infrastructure, and cultural stigma. These findings resonate with the **International Labour Organization (2019)**, which notes that financial constraints often force adults to prioritize immediate income over long-term educational investments. Furthermore,

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Katz & Krueger (2019) point out that cultural perceptions can discourage adult participation in educational programs, particularly among older learners. Addressing these barriers is vital for enhancing access to education and facilitating workforce readiness.

The effectiveness of current re-skilling programs is analyzed in Table 3, revealing that many programs still rely on traditional pedagogical methods. This aligns with **Baker (2018)**, who argues that innovative, technology-enhanced learning methods are essential for engaging adult learners. The lack of flexibility in these programs often leads to low participation rates. **Ogunyemi (2014)** also emphasizes the need for experiential learning and adaptable curricula that reflect the dynamic job market, suggesting that current practices may not adequately prepare learners for the challenges posed by automation and technological advancements. Finally, Table 4 discusses how re-skilling initiatives align with the Sustainable Development Goals (SDGs), particularly Goal 4 on quality education and Goal 8 on decent work and economic growth. The data indicates that successful re-skilling programs not only enhance individuals' employability but also contribute to broader economic stability. This perspective is supported by **the United Nations (2015)**, which emphasizes that equitable access to quality education is crucial for achieving sustainable development. Furthermore, **Brynjolfsson & McAfee (2014)** highlight that a skilled workforce is essential for adapting to rapid technological changes, reinforcing the importance of aligning educational initiatives with market demands. The results across these tables collectively highlight the urgent need for innovative approaches to adult education in Nigeria. Aligning the findings with the views of cited authors underscores the multifaceted challenges faced by adult learners, including significant skills gaps, barriers to access, the necessity for program effectiveness, and the alignment with sustainable development goals. Addressing these challenges through comprehensive policy frameworks and collaborative efforts among stakeholders can pave the way for a more skilled, adaptable, and resilient workforce in Nigeria.

CONCLUSIONS

The challenges posed by automation and technological advancements in the Nigerian job market have created an urgent need for innovative approaches to adult education. The widening skills gap between workforce demands and the capabilities of adult learners poses a significant threat to individual livelihoods and national economic progress. This paper has examined the critical role of adult education facilitators in addressing these challenges through learner-centric and technology-enabled learning methods. The findings emphasize the importance of aligning adult education curricula with evolving labor market needs, fostering a culture of lifelong learning, and leveraging digital tools to improve access and engagement. Facilitators are key in bridging the gap between education and industry, ensuring training programs are responsive to employer demands for both technical and soft skills. By embracing inclusive and flexible pedagogies, facilitators can empower adult learners to navigate the intricacies of an automated work landscape. Recommendations:

1. Relevant authorities in the Ministry of Education, should develop comprehensive policies and frameworks to support the retraining and up-skilling of the adult population, with a focus on building digital literacy, technical expertise, and transferable soft skills.
2. Government should enhance collaboration between educational institutions, government agencies, and the private sector to align adult education curricula with the evolving needs of the labor market.
3. Nigerian Government should invest in the professional development of adult education facilitators, equipping them with the skills and resources to effectively integrate technology-enabled learning methods and learner-centric approaches.
4. Nigerian Government should expand access to technology-enhanced learning platforms, such as online courses and mobile applications, to overcome geographical and economic barriers that limit adult learners' participation in education and training.
5. Nigerian Government through her relevant authorities should implement targeted outreach and awareness campaigns to inform adult learners about the available re-skilling and up-skilling opportunities, addressing cultural perceptions that may deter participation.

6. Nigerian Adult education facilitators should establish flexible learning pathways that accommodate the diverse needs and schedules of adult learners, empowering them to take ownership of their educational journeys.
7. Nigerian Adult education facilitators should foster a culture of lifelong learning by promoting the value of continuous skill development and adaptability in the face of technological change.

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Ethical Considerations

Participants were informed about the purpose of the study, and their consent was obtained prior to data collection. Confidentiality of responses was assured, and participants were free to withdraw from the study at any time without any repercussions.