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*TECHNOLOGICAL INNOVATION IN LEARNING CITIES AND ADULT  
EDUCATION PROGRAMMES: A COMPARATIVE ANALYSIS BETWEEN  
MEXICO AND NIGERIA*

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**Abstract**

In contemporary times, technological innovation has become the order of the day, and different sectors have been able to infuse technological innovations to promote their professions and professionalism; thus, technological innovations are considered in adult education programmes to promote learning cities. Technology and innovation direct facilitators and learners to the point of adult learning and the growing technological innovation. Hence, this study seeks to examine technological innovations in learning cities: a comparative between Lagos, Nigeria and Huejotzingo, Mexico. Four research questions were raised to guide this study. The study as well looked at comparative analysis haven established the justification for comparative in this study as the form of technological innovation used to promote adult education programmes, and for the fact that Nigeria and Mexico share similarities in historical background of how technological innovation have been used over time. Convenient sampling technique was used to select 150 respondents in Somolu local government area of Lagos state, Nigeria. Both primary and secondary data were used. The study shows that insufficient or lack of funds which limit institution to have advanced technology tools could be the major factor that hinders the use of advanced technology in the provision of adult education programme. The paper recommends proper funding of life-long learning by the government; technological education should be included in all adult education programmes and made accessible to all within the state to achieve education for all and sustainability in cities and communities.

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*Keywords: technological innovation; learning cities; adult education*

**Introduction**

For a community to be developed and compete in the digital world we live in, there is an urgent need for the inclusion of technology innovation and equal social activities in adult education programmes. This will enable the learning cities to have a suitable economic standard of living for all without leaving out a group or percentage of the entire community population thereby enhancing equal distributions of opportunities no matter the social status or class one belongs to, be it young or old, literate or illiterate or non-literate. Learning cities (and regions) have emerged as a vehicle to drive place-based lifelong learning across the lifespan through formal, non-formal and informal means. Learning cities and regions have been conceived not only as a means to promote the inclusion of disadvantaged groups but also as a means to foster the development of learning infrastructure to generate inward investment and facilitate business development (Osborne & Hernandez, 2021).

The socio-economic development and opportunities urban learning cities enjoy in our world today did not just fall out of the room, it could be seen as a result of the innovative ideas that were developed and orchestrated in previous years. The implementation of such innovative ideas is made possible as a result of its availability and accessibility to the people in the community regardless of their race, age group, gender and social status. The community members are exposed to skill sets, training and tools that will enable them to improve and increase their income to be able to make sustainable living conditions. Some of these trainings may not be taught within the four walls of the classroom in order to enable equal access to resources by all members of the community, especially the adults. The essence of an infusion of well-planned and inclusive integrated adult education programmes that will encourage technological innovation, introduction and usage of advanced technologies, infusion of technology into daily activities and community development cannot be overemphasized in building learning cities.

Osborne and Hernandez (2021) opined that engagement of human capital resources with effective approaches are essential for creating an innovative and digital solutions that to build the desirable future cities. The current global context of the so-called Fourth Industrial Revolution of fast-paced technological change has put pressure on traditional educational approaches and institutions, calling for us to revisit the learning cities agenda in digital light. It demands a revision of modes of the provision in particular, as well as digital learning engagement and literacy.

Development is not complete if everyone has not contributed to the process within their community. People involved are adults who are the policymakers, and their participation is vital. Therefore, there is a need for adults to be carried along in developments that are sustainable through all the programmes of adult education, interposing them with technological innovations. There is an emphasis on the call for integrated adult education programmes in order to have sustainable community development. In an evolving or relatively new market, there is need to match the supply of skills which is very sacrosanct. However, this requires dexterity and flexibility in education policies which connotes transforming education and training systems such that educational institutions keep pace with technological advancement that can give rise to skills shortages, especially in digital technologies. Furthermore, a holistic approach is required for big data to play an important role in this regard. This also requires collaboration among policymakers, education and training systems, and employers. More often, curricula need to be adapted to emphasize the skills and recalibrate education towards more practical, applied and experimental learning approaches, and the development of skills, competencies and capacities for continuous learning (Taylor, 2003).

It has also been observed that inadequate training deprives adults of creativity and innovation, when adults have skills and adequate training about the internet and technology, there will be an all-around development. A developed community where members can own their wealth, collaborate on activities that foster national security and technological advancement, creatively build innovative projects, revolutionise industries and an equal economic market for all in a conducive living environment. Training on technology innovation and its usage encourages creativity and it has motivated adult learners to take

initiatives that serve as propellants for sustainable socio-economic community development in learning cities.

### **Problem statement**

It is no more news that the era of analogue is fast becoming a thing of the past and at the centre of this evolutionary community development is the technological innovation in learning cities. The more a city embraces technology, the vast opportunities such a community enjoys range from its economic growth, health benefits, the standard of living, etc. A community that fails to embrace technological innovative learning seems to be left behind; it seems that there is a need to have a heterogeneous curriculum and educational programmes that will enlighten the community with more focus on adult education and lifelong learning programmes. It appears that programmes should be powered by the community members' involvement and participation in learning digital skills, methodology, innovations so as to put the learning cities on a global roadmap. Therefore, it is pertinent to do comparative studies of two learning cities – Huetjizingo, Mexico and Lagos, Nigeria. Both driven by their fast technological intervention in restructuring and developing their communities, have been listed as learning cities by UNESCO.

### **Aims and objectives**

This study will attempt to evaluate the technological intervention in the achievement of learning cities in Lagos state, Nigeria. Specifically, the study sought to:

- Find out how technological intervention can be used to achieve lifelong education in Lagos state.
- Determine how introduction of technological innovations into adult education will stimulate creativity in the people of Lagos state.
- Examine how technological intervention can be used to increase sustainability.
- Assess the importance of community involvement and participation in the achievement of learning cities.

### **Research questions**

**The study seeks to provide answers to the following questions;**

1. How can technological intervention be used to achieve lifelong education in Lagos state?
2. What form of technological innovations will stimulate creativity in the people of Lagos state?
3. How can technological intervention be used to increase sustainability?
4. What is importance of community involvement and participation in the achievement of learning cities?

### **Scope or delimitation of study**

The study was limited to the youths aged 18 (legally recognized age for adulthood in Nigeria) and above within Shomolu Local Government Area in Lagos state due to overpopulation which could pose a constraint in surveying the state.

### **Technological innovation**

Technology involves the purposeful application of knowledge, experience and resources to create products and processes that meet human needs. Information Communication Technology (ICT) is now required for people to function in the modern society and may even be necessary for human survival in the future (Bakare, 2013).

According to Urabe (1988), innovation suggests generating a fresh idea and its implementation in a new product, procedure or service, which leads to a dynamic growth of national economy and increased employment, as well as creating of clear profit for an innovative business organization.

Williams and Graham (2010) assert that technological innovations have spurred potential use of electronic resources for learners of all ages over the last decade. These global developments also require continual advancement of electronic e-learning evaluation.

Technological innovation is expedient in the educational system because of its significant impact at all educational levels. In other words, the need for technological innovation in our educational system cannot be over emphasized as the world is fast becoming a global village. It is also important to note that 'Inclusiveness' can be easily achieved with technological innovations. When we talk about the United Nations 2030 SDG agenda - Leave No One Behind, a lot of people limit it to children, i.e., the less opportune children in rural areas. However, there is no way we can achieve the goal of inclusiveness if the adults who play key roles in policy-making are not up-to-date with technological innovations. For example, a city cannot be regarded as a learning city if more than half of the population are not up to date with trends. Technology is the new trend of creating input to achieve output using specific devices to improve the efficiency and quality. Therefore, application of this to education field has transformed learning in present time.

The importance of ICT cannot be overlooked. On daily basis, there are lots of information circling the globe, and this demands that we avail ourselves of all necessary information through the use of information technology. The adult learner therefore should be exposed to a wide range of information and technology wherewithal to enrich his/her learning experience at their convenience. The emergence of technological innovation has increased a concerted call for learners to take charge of their learning and have a more active role, using the advantage of rich resources for learning made available by information technology e.g., Youtube, E-library, etc.

### **Learning cities**

Learning Cities according to UNESCO, is described as a city that effectively mobilizes its resources in every sector to promote inclusive learning from basic to higher education; revitalizes learning in families and communities; facilitates learning for and in the

workplace; extends the use of modern learning technologies; enhances quality and excellence in learning; and fosters a culture of learning throughout life (Borkowska & Osborne, 2018). In doing so, the city enhances individual empowerment and social inclusion, economic development and cultural prosperity, and sustainable development. It is believed that when the learning city is achieved, there will be maximum development in the society, artisans would be able to function effectively and everyone would be able to contribute meaningfully into the development of the society.

Learning cities can benefit greatly from sharing ideas with other cities at all developmental stages. The Network supports the achievement of all seventeen Sustainable Development Goals (SDGs), in particular SDG 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all and SDG 11 - Make cities and human settlements inclusive, safe, resilient and sustainable (Borkowska & Osborne, 2018). Furthermore, Borkowska and Osborne (2018) stated that the UNESCO GNLC supports and improves the practice of lifelong learning in the world's cities by promoting policy dialogue and peer learning among member cities; forging links; fostering partnerships; providing capacity development; and developing instruments to encourage and recognize progress made in building learning cities. While national governments are largely responsible for creating strategies for building learning societies, lasting change requires commitment at the local level. A learning society must be built province by province, city by city, and community by community.

To achieve a learning city, adult education could serve as a tool for gathering adults from various backgrounds as the respondents. Adult education changes the social and psychological minds of adults more than any other profession, it instills lost hope in them and liberates them from the shackles of ignorance, it also builds their esteem, and self-liberation. Adult education awakens adult learners to become aware of their environmental (social, economic, cultural and political) and psychological potentials as well as hidden abilities; It also exerts enormous influence on the larger society in terms of national development. Adult education continues from where the teacher in the formal school system who rigorously inculcates in the individual the desire for knowledge, understanding and education stops. Adult education is one of the fields of academic endeavour that is saddled with the responsibility of solving socioeconomic, cultural, political and environmental problems. There is positive association between adult education programmes and increased levels of self-esteem and high levels of knowledge and skills which thereby encourage positive and active engagement of people in their own development (Hussain, 2013).

### **Adult education**

The term adult education is nebulous. That is, it is broad and open to different definitions. Adult education just like other fields in social sciences, humanity and management is a vague term which many scholars and institutions have attempted to define in their own ways.

Adult education was defined by UNESCO (1976) as the entire body of organizational process, whatever content, level and method where formal or otherwise, whether they

prolong or replace initial education in schools, colleges and universities as well as apprenticeship, whereby persons regarded as adult by the society which they belong develop their abilities, enrich their knowledge, improve their technical or professional qualifications or turn them in a new direction and bring about change on their attitude or behavior in two fold perspective of full personal development and participation in balance and independent social, economic and cultural development (Jarvis & Wilson, 2004).

Nzeneri (2002) defined adult education as any education given to adult based on the social, economic, political, and cultural needs to enable them adjust fully to change and challenges in their lives and communities. It is important to note that adult education is an agent of social change. That is, it is the kind of education given to adults to enhance community development and in the modern society, there is need for adult education programmes to adopt technological innovation so that adults can keep up with trends.

Furthermore, Bakare (2013) opined that adult education is meant to serve the individual in a variety of ways. She further stated that adult education could help to remedy deficiencies in their formal education, in developing themselves vocationally, health-wise, and even for leisure. There are so many programmes imbedded in adult education e.g., literacy education, workers education, vocational education, labour education, leisure education, pre-retirement education, mass education, remedial and continuing education, etc. All these programmes and so many others not listed are infused into adult education to achieve lifelong education. Adult education is more than mere education for illiterates adults, it is necessary for a wider intellectual, political, civil, and cultural growth.

Adult education is a force for change which by all intents and purposes can help conscientize and mobilize the society in determining its ends by bringing into focus a maximum or re-orientation and adjustment of the value system, attitude and behaviour to any new and changed situation within a limited period of time. This change may be from within or outside any given society. However, it is expected to impart the new skills and techniques required to sustain the innovation (Obashoro, 2017).

Bakare (2013, p. 22) listed the following as the purpose of adult education to every nation:

- “to develop a critical understanding of major contemporary problems and social change;
- to develop the attitude of acquiring new knowledge, qualifications, attitudes or forms of behaviour;
- ensuring the individual's consciousness and effective incorporation into the world of work;
- promoting increased awareness of the relationship between people and their physical and cultural environment, and
- creating an understanding of and respect for the diversity of custom and cultures.”

### **Technological innovation and adult education**

The use of technology in adult education allows the adult learner to learn at his/her own convenience. Learning has become very flexible with the emergence of technology, people can learn in their own space and at their pace. For example, the Covid-19 pandemic

period in the year 2020 had almost all the nations across the world at their wits end but with technology, they were able to avert what would have become an eternal crises. Experts, while comparing the Covid-19 pandemic with the 1918 Influenza pandemic, stated that the methods and swiftness in fighting against the Covid-19 was tenacious than the former; and this is all thanks to technological innovations (Krueger, 2021). Furthermore, learning was not affected because while there was a sit-at-home order globally, E-learning became the order of the day. Learning continued through various technological innovations like zoom, Youtube, etc. Also, in face-to-face learning, the use of whiteboard, computers, audio-vision instructional materials are all part of technological innovations.

Technology in adult education also affects the conduct of adult educators (facilitators) who need to upgrade to a new frontier of teaching practice and become more acquainted with the importance of digital technology not only as tools, but its effects in adult education opportunities. The facilitators must develop and use innovative strategies to promote quality teaching/learning and create conducive atmosphere for the learners by capitalizing on digital technology. This is however manifested through their instructional designs and delivery mode. The digital age adult educator must be vast in techniques. H/she must shift from being a teacher to being an enabler or facilitator of adult learning through the use of technology. Therefore, such person must be adequately trained in the use of modern technological tools that can enhance the classroom experience and encourage the learner to be more autonomous.

The adult educator must first have access to the technology; this, unfortunately, is still a challenge in most developing countries like Nigeria and Mexico. The educator must be familiar with the various technologies available, and how to apply them under different circumstances to disseminate learning, especially online. "In order to maximise the use of technology, adult educators must be able to answer the pertinent questions about which knowledge is most important for the adult learner, as well as the best way to transmit and display this knowledge for better understanding and learning" (Bakare, 2013, p. 196)

It is no doubt that technology presently plays a vital role in communication, especially in adult education. Technology has made communication methods easier and more varied. In adult education, equipment-oriented instructional techniques have become very useful to adults in terms of helping them to harness the appeal of the senses, as well as learn more conveniently in terms of distance and correspondence education (Bakare, 2013). Technological innovation now pervades all of adult education. It helps to comply with andragogical principles and enriching adult education practice.

### **Similarities and differences between Huetjozingo, Mexico and Lagos, Nigeria**

Lagos State Lagos is the largest city in Nigeria and the most populous city in Africa, with a population of 14.8 million as of 2015 within the city proper (Ayorinde, et. al., 2015). The Lagos metropolitan area has a total population of roughly 23.5 million as of 2018, making it the largest metropolitan area in Africa (Ayorinde, et. al., 2015). Lagos is a major African financial centre and is the economic hub of Lagos State and Nigeria at large. The megacity has the fourth-highest GDP in Africa and houses one of the largest and busiest seaports on

the continent (Idowu, et al., 2011). The Lagos metropolitan area is a major educational and cultural centre in Sub Saharan Africa. The Lagos State Government operates state schools. The education system is the 6-3-3-4 system, which is practised throughout the country (as well as by many other members of the Economic Community of West African States). The levels are Primary, Junior Secondary School (JSS), Senior Secondary School (SSS) and university.

Huejotzingo Puebla is a small city and municipality located just northwest of the city of Puebla, in central Mexico. The city with about 90,000 population is popularly known for their carnival which is described as spectacular and unlike any other carnival in Mexico or in the world (Kath, 2014). The municipality is considered to have a low level of economic marginalization, with about one third of its community considered to have a high or somewhat high level. The major economic activity in Huejotzingo is agriculture, followed by industry. Agriculture, forestry and fishing employ about 39% of the municipality's population (Jiménez, et al., 2020).

In October 2021, Huejotzingo was one of the ten recipients of the Learning Cities Award from UNESCO (Kath, 2014). Huejotzingo qualified for the outstanding award by placing lifelong learning at the centre of its development. The city transformed itself from an agricultural community to the industrial heart of the Mexican state of Puebla. This was easy to achieve through a comprehensive learning strategy strengthened by equity and inclusion prioritization, sustainable development and entrepreneurship, and implementation of various learning projects over the years. These learning projects have helped reduced illiteracy by 50%, expanding access to the internet and new technologies (Jiménez, et al., 2020).

The infusion of technological innovation and adult education programmes in learning cities aids in tackling the community socio-economic challenges. Technological innovation has been seen as emerging leverage that the community stakeholders adopt while transforming the community from traditional to modern development. Lagos, Nigeria just like Huejotzingo, Mexico has adopted the idea of innovative technology to sustain communities and cities to increase the citizens' standard of living; to attend to difficulties and challenges faced by cities and communities. These challenges create obstacles and make it difficult and nearly impossible to fasten socio-economic development and inhibit improved standard of living of the dwellers as well as cities and communities outlook. Through the introduction of cutting-edge innovation and technology in adult education and lifelong learning, these two learning cities have experienced remarkable development in recent years within their social, economical, and environmental sectors. For instance, these two cities share a common background in agriculture. Just like Huejotzingo, Lagos like other parts of the country was known for agriculture before it became a megacity.

These two cities no longer restrict their sustainability focus and revenue generation to traditional agriculture, rather unlike every other community in their countries; they have introduced innovation and technology which made them become the centre for industrialization and commercialization.

According to the UNESCO Institute for Lifelong Learning report, Huejotzingo supported 1,000 female entrepreneurs in setting up projects, and organized its first ever Festival of



Learning with participation of more than 25% of the city's more than 90,000 inhabitants (Sirolli, 1999). Similarly, the Lagos State Government in 2019, awarded twenty-young innovators and tech firms a total grant of hundred million naira (N100,000,000.00) to pursue various technology-driven innovations across the six pillars of the development agenda of the present administration (Sirolli, 1999). This grant however is an annual intervention to facilitate and encourage the development of innovative solutions to solve local problems, using cutting-edge technology.

More so, the Escuela Campesina School in Huejotzingo could be likened to the government vocational and technical colleges in Lagos state, where adult learners are exposed to diverse skills and curricula ranging from agricultural courses, creative designing skills, entrepreneurial opportunities, to practical fieldwork where they implement the knowledge gained during their studies into real-life events happening in the community. Also, to achieve inclusive learning for all, these two cities have created an enabling society whereby the public have free access to the internet and new technologies. Through the use of the "smart city programme," there has been an installation of 6,000-kilometre fibre optic cables across the community, schools, institutions, government parastatals, health facilities etc. which has enhanced the high-speed internet access and digital support of infrastructures and technological advancement of the city (Jiménez, et al., 2020).

Nigeria and Mexico have quite a number of similarities in their historical, geographical, and educational aspects. In terms of education, funding often gets short shrift partly because it is hard for politicians to see the political benefits of an investment that won't show dividends in the workforce for years. However, the case is slightly different when it comes to adult education as there are different providers of the programme. In Nigeria, there are various providers of adult education and they classified into two namely, internal and external providers:

**Internal Providers:** these providers operate within the country. They are locally formed and organised. Examples of internal providers are as follows: -

- Statutory Providers: they are set up by specific laws and whose activities are further backed up by such laws. These providers have core aims of supporting adult education e.g., educational and other ministries, local government councils, National Commission for Mass Literacy and Non formal Education (NMEC), etc.
- Quasi-Statutory Providers: these groups are made up of organizations set up by laws but are not obligated to cater for adult education. However, some of their functions require meeting the education needs of adults. Example of providers in this group are the Universities, Mass media, Industrial Training Fund (ITF), Museums, Library, Centre for Management Development, etc.
- Non-Statutory Providers: this group involves those organizations whose activities are not backed up by law. However, they are often registered with Corporate Affairs Units; they have access to operate within the guidelines of their own descriptions and focus. They operate under various groups such as Non-governmental organizations (NGO), Faith-based organization (FBO), work oriented organization, community-based organizations (CBO), etc. (Obashoro, 2017).

**External Providers:** these may be described as global, international and regional organizations that concern themselves with the provision of adult education. The followings are examples of external providers of adult education in Nigeria:

- Global Organization: under the global organization, there are the Non-governmental organizations and Inter-governmental organizations. In the non-governmental group, there are those who take adult education as their major concern e.g., ICAE. There is another group within the NGO whom adult education forms a part of their work e.g., IPPF. The Inter-governmental organizations on the other hand, consist of those who sees adult education as an important part of their work e.g., UNESCO; and another set of groups with some interests in adult education e.g., WHO, ILO, etc. Apart from the NGOs and IGOs, there are also charitable institutions under the global organization group whose generosity have helped in catering for adult education e.g., Ford Foundation and Friedrich Ebert Foundation.
- Regional Organization: just like the global organization, the regional organization is also divided into Non-governmental organization and Inter-governmental organization. The NGO have those who see adult education as their major concern like the African Adult Education Association (AAEA), and the ones with some interests in adult education like the Association of African Universities (AAU). The Inter-governmental organization on the other hand, consists of organizations like the African Union (AU) and European Union (EU) (Obashoro, 2017).

In Mexico, providers of adult education include: Instituto Nacional Para la Educacion de los Adultos (National Institution of Adult Education), DVV International, Instituto Estatal de Educación para Adultos (State Institute for Adult Education) IEEA International Council of Adult Education (ICAE), etc. (Obashoro, 2017).

Despite the similarities between these two cities, the difference in size could pose a problem in the success and effectiveness of whatever approach may be used in the development of lifelong learning approach. Lagos is seen as an urban megacity with a population of over 15 million, HuejoZingo, on the other hand is a fast-developing rural city with over 90,000 inhabitants. The difference in population between these two learning cities can be considered as the major constraint for Lagos compared to Huejotzingo.

Also, there is a difference in adult education policy between the two learning cities. The Nigerian National Policy on Education which was adopted in 1977 and modified in 1981 provides for equal access to education, including continuing and further education, and commits to the eradication of illiteracy and promotion of lifelong learning. (Obashoro, 2017). That is to say, education at all stages is a major priority in Nigeria, and this is in tune with the number one agenda of the International Benchmarks on Adult Literacy (Literacy is about acquiring and using reading, writing and numeracy skills, and thereby the development of active citizenship, improved health and livelihoods, and gender equality). "The education of adults and young people is not a priority in Mexico compared to the education of children, and this can be clearly seen in the miserly budget, which over the past decade has never reached 1 % of the total education budget. Literacy in particular

has not been a priority over the past 12 years; it does not figure in the public policy agenda and was not included in the last two government programmes. This just widens the vacuum that other non-government initiatives began to fill." (Hinzen, et al. 2022).

## **Comparization of technological innovation and adult education in Huejotzingo, Mexico and Lagos, Nigeria**

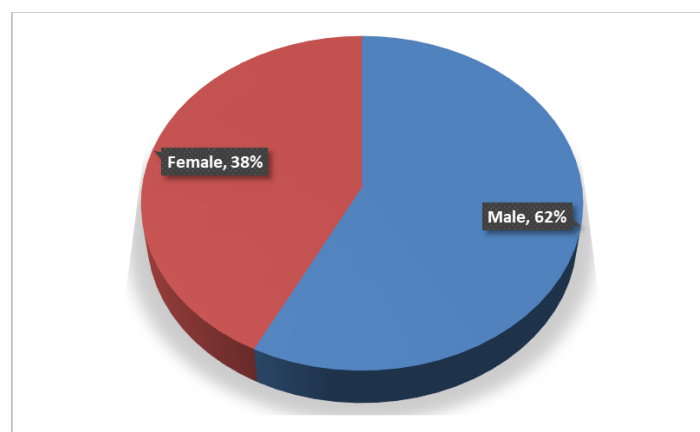
### **Research methods**

The study is meant to compare technological innovation and adult education in two UNESCO's learning cities - Huejotzingo, Mexico and Lagos, Nigeria. Lagos State was chosen because of its cosmopolitan and unique nature. It is unique because it was formally the federal capital of Nigeria, and so all the ethnic groups of Nigeria are adequately represented in Lagos State because it is also the commercial nerve of Nigeria. Somolu Local Government Area is one of the largest local government therefore it would be considered for the study. Somolu local government has a total population of 403,569 with a good population of 221,963 of youth (Ayorinde, et. al., 2015). Convenient sample technique was used to pick a total sample of 150 youth from six different constituent wards out of 11 wards in Lagos Shomolu local Government. These selected youth were chosen because they possess good knowledge of the issue under study. The items in the questionnaire were analysed with the use of and frequency count and simple percentages.

### **Demographic data of the respondents**

The total number of 150 youths in the Shomolu local government area were selected at random to fill out questionnaires. The participants age ranged from 18 - 45. The questionnaires were administered over a 2-week period in December, 2021.

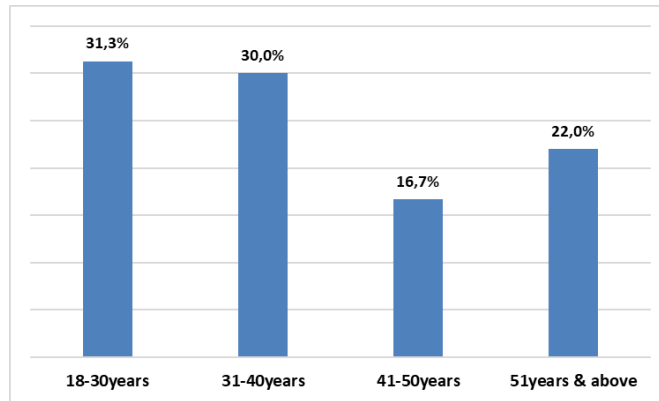
Figure 1: Gender of the respondents (N=150)



Source: own figure, field survey, 2022

The pie chart shows that 38% of the total respondents were females while 62% were males. This implies that majority of the respondents that gave their opinion on technological innovation in learning cities and adult education programmes in Lagos state, Nigeria were males.

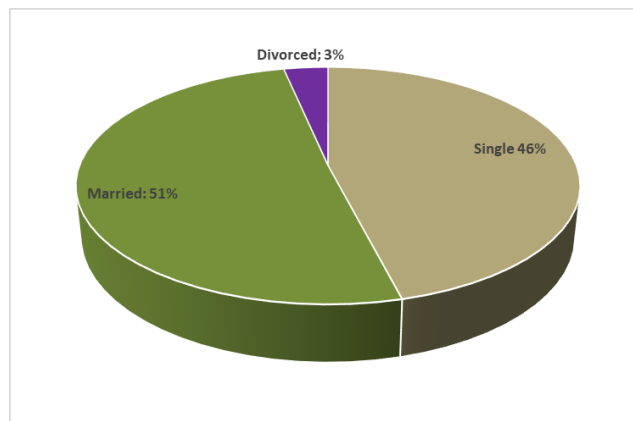
Figure 2: Respondents' age range (N=150)



Source: own figure, field survey, 2022

Figure 2 shows that 31.3% of the total respondents are between 18-30 years of age, 30% are between 31-40 years, 16.7% are between 41-50 years and 22% are 50 years and above.

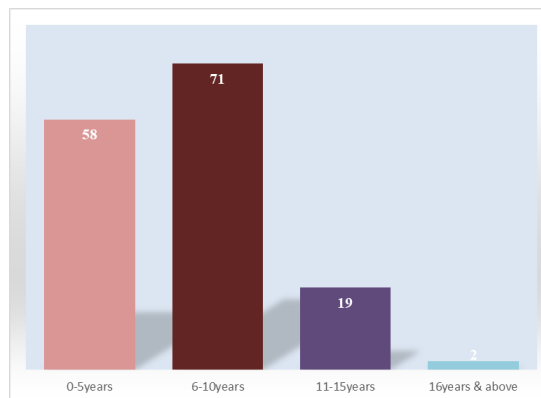
Figure 3: Marital status of the respondents (N=150)



Source: own figure, field survey, 2022

Also, 46% of the total participants are single, 51% are married and 3% are divorced. This indicates that majority of the participants are married.

Figure 4: Years of learning (N=150)



Source: own figure, field survey, 2022

Figure 4 shows that 58 of the total respondents had 0-5 years of learning experience, 71 had 6-10 years, 19 had 11-15 years and 2 had 16 years and above learning experience.

### Analysis of research questions

Table 1 shows that 13.3% of the respondents opined that the technological intervention can be achieved by giving all youths the opportunity to have basic education, 20%) opined that the technological intervention should be achieved by dividing learning programme into sections (morning, afternoon and evening), 16.7% of the respondents also opined that the technological intervention could be achieved by organizing learning programs in various centres or areas, 20% opined that the technological innovation can be achieved by allowing people to choose different computer packages. Also 13.3% are of the opinion that technological innovation can be achieved by making learning of computer free and accessible while 16.7% opined that making learning inclusive in all schools can lead to the achievement of technological innovation.

Table 1: How can technological intervention be utilized to achieve lifelong education in Lagos state? (Research Question#1) (N=150)

Response	Number of Respondent	% of respondents
By giving all youths the opportunity to have basic education.	20	13.3
By creating technological innovation hubs in almost all the local government of the state	30	20
By inculcating digital skills in learning programmes in various adult education centers in Lagos state.	25	16.7
By enacting digital transformation policy on learning in the state	30	20
By making computer learning free and accessible for all categories of learners.	20	13.3
By prioritizing inclusive digital literacy in the education sector.	25	16.7
Total	150	100

Source: own table, field survey, 2021

Table 2 shows that 33.3% of the respondents opined that teaching of basic computer would stimulate creativity, 20% suggested that learning of Corel draw could simulate creativity, 16.7% of the respondents also suggested that access to basic laptops or desktop would stimulate creativity in Lagos, 16.7% opined that provision of high internet speed will stimulate creativity in Lagos state while 13.3% are of the opinion that digital literacy would stimulate creativity in Lagos.

Table 2: What form of technological innovations will stimulate creativity in the people of Lagos state? (Research Question#2) (N=150)

Response	Number of Respondent	% of respondents
Teaching of basic computer programs	50	33.3
Teaching of basic Microsoft computer applications	30	20
Exposure to basic computer programming	25	16.7
Exposure to data analysis programming applications	25	16.7
Promotion of digital literacy	20	13.3
Total	150	100

Source: own table, field survey, 2021

Table 3 shows that 33.3% of the respondents opined that improving digital literacy rate among the youths could improve sustainability, 20% suggested that creating free browsing centres would sustain suitability, 16.7% of the respondents also suggested that access to basic laptops or desktop would sustain suitability, 16.7% opined that provision of free internet access will sustain suitability while 13.3% are of the opinion that teaching computers after school would encourage sustainability.

Table 3: How can technological intervention be used to increase sustainability? (Research Question#3) (N=150)

Response	Number of Respondent	% of respondents
By improving digital literacy rate of youth	50	33.3
By creating free browsing centre	30	20
Given equal and free access to computer	25	16.7
By providing free access to internet	25	16.7
By encouraging schools to teach computer after school hour	20	13.3
Total	150	100

Source: own table, field survey, 2021

Table 4 shows that 33.3% of the respondents opined that the importance of the community participation is planning, 20% suggested that funding is one of the importance of community involvement, 16.7% of the respondents also suggested that Evaluation is the aim of community participation, 16.7% opined that program management is the importance of community involvement while 13.3% are of the opinion that program monitoring is the importance of community participation.

Table 4: What is the importance of community involvement and participation in the achievement of learning cities? (Research Question#4) (N=150)

Response	Number of Respondent	% of respondents
It enhances the cultivation of change enablers in the society	50	33.3
It encourages warm and friendly acceptance of developmental changes in the community	30	20
It encourages community members to take ownership of developmental projects in the society.	25	16.7
It will promote effective planning and execution of self-help project execution in the society.	25	16.7
It encourages harmonious and collective working relationships among community members towards achieving smart learning cities.	20	13.3
Total	150	100

Source: own table, field survey, 2021

### Discussion of findings

Findings from research question one shows that in order to achieve technological innovation in Lagos state, the youths should be given the opportunity to have basic education; learning programmes should be divided into sections (morning, afternoon and evening); learning programmes should be organised at various centers; people should be allowed to choose from different computer packages; learning of computer should be made free and accessible, and inclusive learning should be introduced in the education sector. This is in tandem with what was done in Huetjizingo, Mexico which led to being a beneficiary of the UNESCO learning cities award life (Borkowska & Osborne, 2018). This is also corroborated by UNESCO which defined learning cities as a city that effectively mobilizes its resources in every sector to promote inclusive learning from basic to higher education; revitalizes learning in families and communities; facilitates learning for and in the workplace, extends the use of modern technologies; enhances quality and excellence in learning and fosters a culture of learning throughout life.

Findings from research question two portrayed teaching of basic computer program, learning of Corel draw, access to basic computers, provision of high internet speed, and digital literacy. These forms of technological innovation have been used in developed nations like the United Kingdom (UK) and Italy. They have also been tested in developing cities (Huetjizingo, Mexico) which yielded positively by earning them an award of recognition from UNESCO. If they can be invested in and made use of accurately, the feat of learning cities would be achieved in Lagos, Nigeria especially through adult education programmes. Kolb (2013) also corroborated the study with the suggestion that the infusion of technological innovation and adult education programmes in learning cities aids in tackling the community socio-economic challenges.

Findings from research question three reads improving digital literacy rate among the youth, creating free browsing centres, equal and free access to computer, provision of free access to the internet, encouraging schools to teach computer studies after school hours can be used to achieve sustainability. All these have been used in the developed cities and they yielded positively. Countries like Mexico and Italy have also tried it and it worked for them. The finding is also corroborated by Osborne and Hernandez, (2021) who opined that developing friendly application learning tools that can stimulate retention of learning and as well as transform the learning patterns of participants would ensure application of knowledge for building smart cities.

Findings from research question four shows that community participation involves planning. Without proper planning, all efforts will go to waste. Also, there is need for adequate funding and evaluation. The evaluation process could be formative or summative.

## **Conclusion**

The role of adult education in development is not limited only to economic and social spheres. It is multi-dimensional. There is a strong link between adult learning and democracy. This is so because, as acknowledged at the UNESCO Fifth International Conference on Adult Education held in Hamburg in 1997, “substantive democracy and a culture of peace are not given; they need to be constructed “(UNESCO, 1997)

Adult education, when properly funded will fill the gap between the rich and the poor. With the infusion of technology into adult education programmes, there will be smooth integration of economies in the global world. Adult education is instrumental in familiarizing the active population of Nigeria with Information Communication Technology (ICT), a decisive tool for the smooth integration of Nigerian economies in the global economy. The importance of this cannot be over-emphasised as the world is rapidly moving towards knowledge-based economic structures and information societies that comprise networks of individuals, firms, and countries linked electronically in inter-dependent and interactive relationships. Adult education also plays a major role in social development. It is now widely admitted that growth will not reduce poverty unless poor people are able to actively participate in it. Such participation can become effective to a large extent through adult education.

It is recommended that adult education curriculum be reviewed to accommodate ICT learning to help train adults in skills that will stimulate their creativity and make them innovative in all areas of their lives to increase sustainability. Hence, a similar model which was used in Huejotzingo (Mexico) can also be used perfectly in Lagos (Nigeria) to stimulate life-long learning. Also, there is need to invest in the quality of adult learning provision. Segregation should be shunned and quality education should be made accessible to all.



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## Appendix 1: Technological Innovation in Learning Cities and Adult Education Programmes: A Comparative Analysis between Mexico and Nigeria, questionnaire, 2021

Dear Respondents,

My name is Ndidiamaka Annie Ogonnaya, a Master's student of Manpower Training and Development at the University of Lagos' School of Postgraduate Studies.

This questionnaire is designed to obtain information on Technological Innovation in Learning Cities and Adult Education Programmes in Nigeria.

You are requested to kindly complete the questions as honest as possible.

Please be assured that your response will be used strictly for the purpose of this study and would be handled with utmost confidentiality.

Best regards,

Ndidiamaka Annie Ogbonnaya.

**SECTION A: DEMOGRAPHIC DATA**

**Instruction:** kindly tick (√) the appropriate response.

Gender: Male [ ] Female [ ]

Age of respondents: 18-30 yrs [ ] 31-40 yrs [ ] 41-50 yrs [ ]  
50 years and above [ ]

Years of learning: 0-5 years [ ] 6-10 years [ ] 11-15 years [ ] 16+ years [ ]

Marital status: Single [ ] Married [ ] Divorced [ ]

**SECTION B**

**Instruction:** Kindly tick ( $\sqrt{\quad}$ ) your level of agreement with regards to the statements below. (Choose one option only)

**Key:** Strongly Agree (SA), Agree (A) Disagree (D), Strongly Disagree (SD).

S/N	ITEMS	SA	A	D	SD
	<b>How can Technological Innovation be utilized to achieve Lifelong Education in Lagos, Nigeria?</b>				
1.	By giving all youths the opportunity to have basic education.				
2	By creating technological innovation hubs in almost all the local government of the state				
3	By inculcating digital skills in learning programmes in various adult education centers in Lagos state.				
4	By enacting digital transformation policy on learning in the state				
5	By making computer learning free and accessible for all categories of learners.				
6	By prioritizing inclusive digital literacy in the education sector.				
	<b>What form of Technological Innovation will stimulate creativity in the people of Lagos State?</b>				
7	Teaching of basic computer programs				
8	Teaching of basic Microsoft computer applications				
9	Exposure to basic computer programming				
10	Exposure to data analysis programming applications				
10	Promotion of digital literacy				
	<b>How can Technological Innovation be used to enhance sustainability of learning in adult education programmes?</b>				
12	By developing friendly application learning tools that can stimulate retention of learning				
13	By creating innovation hubs for cross-fertilization of ideas				
14	Promotion of eco-friendly application tools for self-pace learning				
15	Encouraging the use of technological artificial intelligence to determine learning preference of adult learners.				
16	By transforming adult learning activities into educational mobile application tools				
	<b>What is the importance of community involvement and participation in the achievement of Learning Cities?</b>				
17	It enhances the cultivation of change enablers in the society				
18	It encourages warm and friendly acceptance of developmental changes in the community				
19	It encourages community members to take ownership of developmental projects in the society.				
20	It will promote effective planning and execution of self-help project execution in the society				
21	It encourages harmonious and collective working relationships among community members towards achieving smart learning cities.				