Urbanization and User's Perception of Spatial Variation of Smartphone Addiction in Ibadan, Oyo-State, Nigeria

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ABSTRACT

The study explored the perception of smartphone addiction in an urban area of Ibadan, Oyo State, Nigeria. Smartphone addiction involves excessive use of smartphones for social media, gaming, and other applications, leading to difficulty coping without them. The research aimed to investigate the spatial variation of smartphone addiction among users in Ibadan, employing a mixed survey research method. Four Hundred (400) structured questionnaires were distributed across the LGAs in Ibadan, and the Smartphone Addiction Scale (SAS) with six subscales was used to question respondents. Maps were utilized to display the spatial variation of smartphone addiction, and gender differences among users were also analyzed. The Global Moran's I test revealed significant spatial autocorrelation of smartphone addiction in Ibadan. The results indicated substantial variation in smartphone addiction levels across locations. This research may contribute to reducing smartphone usage and provide insights into why certain areas may be more susceptible to addiction. It highlights the importance of psychologists changing users' thoughts, attitudes, and behaviors towards smartphone use. Communication agencies should also educate users on leveraging smartphones for positive impacts.

Keywords: Smartphone Addiction, Smartphone Addiction Scale (SAS), Spatial Variation

INTRODUCTION

Background to the study

Urbanization is the process of people moving into large, multifunctional communities in urban areas (Mabogunje, 1985; Awe and Akinluyi, (2022). It involves migration from rural to urban areas, with population growth occurring as a result of this migration (UN-Habitat, 2006). According to the World Bank (2008), urbanization also encompasses the revitalization of cities, the efficient organization of urban spaces, and the enhancement of urban functions. The connection between smartphone use and urbanization is complex, with each impacting the other in different ways. Urban areas typically have better infrastructure, including more extensive and reliable mobile networks. This helps to increase smartphone adoption and usage, allowing residents to stay connected, access information, and use digital services more easily. Smartphones provide access to numerous services essential for urban living, such as transportation such as ride-sharing apps, food delivery, e-commerce, and digital payments. These services can enhance the efficiency and convenience of life in densely populated areas

Smartphone addiction is a behavioral condition characterized by an extreme focus on a smartphone, involving interactions on social media, playing games, and using other applications on the device (Choi, 2015). It is a reactive disorder that negatively impacts a person's relationships with others and the outside world, causing a

reliance syndrome known as nomophobia, which is the fear of being without a smartphone. Smartphone addiction is a condition characterized by excessive use of mobile devices, often measured by how often users access their smartphones and how much time they spend online. Family members, friends, coworkers, and others close to an individual may have serious concerns about their excessive phone use (LaRose & Eastin, 2010; Don, 2012; Oulasvirata et al., 2015).

The rapid technological progress of smartphones in the last century has had a profound influence on all aspects of society. With their wide range of applications providing instant access to the internet and social media platforms such as WhatsApp, Facebook, Twitter, and Skype, as well as easy access to SMS and the internet, smartphones have become an essential part of modern life (AboJedi, 2008). Smartphones also offer entertainment features such as games, cameras, videos, Bluetooth, multimedia, radio, YouTube, movies, GPS, and other apps that many people have become dependent on. Unlike other devices like desktops or laptops, smartphones are highly portable and mobile, leading to their overuse. An uncontrollable fear of losing access to one's phone or not having connectivity is a common symptom of smartphone addiction, known as nomophobia (LaRose & Eastin, 2010; Griffiths, 2013; Oulasvirta et al., 2015). Due to their increasing popularity and overuse, smartphone addiction is more prevalent among students and urban dwellers in Nigeria. It has been shown to have negative effects on socioeconomic status, educational level, and physical and psychosocial health, leading to issues such as neck stiffness, blurred vision, wrist or back pain, sleep disturbances, and reduced in-person social interaction (Kuss et al., 2014; Fasae & Adegbilero, 2015; Haug et al., 2016).

In urban settings, smartphones help maintain social connections and expand professional networks through social media, messaging apps, and professional networking platforms. The proliferation of smartphones in urban areas opens up new economic opportunities, including gig economy jobs, remote work, and digital entrepreneurship. These opportunities can drive further urbanization as people migrate to cities in search of better employment prospects.

Empirical evidence reveals that most smartphone addicts are urban residents, influenced by high exposure and technological advancement, leading them to rely on smartphones for communication without face-to-face encounters (Walsh, White, & Young, 2007). Analysts have projected that over a third of the world's population, estimated at 2.53 billion, will own a smartphone by 2018, while smartphone shipments worldwide are expected to reach 1.71 billion by 2020. Additionally, nighttime smartphone use leads to late waking, and some students report that they cannot live without smartphones. In a US study, 65% of participants (N = 1061) reported that they could not live without smartphones (Wajcman, Bittman, Jones, Johnstone, & Brown, 2007). Nearly 70 percent of Belarusian university students were convinced of the harmful effects of smartphones (Szpakow, Stryzhak, & Prokopowicz, 2011). This study aims to analyze the geographical variation of smartphone addiction and usage patterns among users in Ibadan, Oyo State, Nigeria.

The Statement of the Problem

Although the use of smartphones as a gadget has positive effects on all aspects of life, the study of addictive behaviors is urgently needed. According to Gupta et al. (2016) and Mustafi et al. (2017), smartphone addiction among users is becoming a serious threat to public health. The physical, mobile aspect of the smartphone facilitates problematic Internet behaviors (i.e. obsessive social media use, porn, and gambling addiction) by making them accessible anytime and anywhere; therefore increasing how often they are used has been discussed in recent research, which could lead to negative implications in all ramifications.

Previous research on smartphone addiction has addressed smartphones as a single addictive entity, measuring the level of "smartphone use" or "smartphone addiction," although the smartphone itself is causing the problems in the way that humans have found it difficult to cope without a smartphone. The problems arising from smartphone use are dependent on what activities the user engages in while on the smartphone, the motivations for engaging in these activities, and the gratifications received from them which then reinforce continued use (Jeong, Kim, Yum, & Hwang, 2016; Lopez-Fernandez et al., 2017).

Most of these studies focus on the level of addiction but fail to examine the spatial variation of smartphone

addiction among users in Ibadan, as addictive behavior has not been thoroughly examined, and urban areas are more likely to be addicted compared to rural locations. This study attempts to analyze the spatial variation of smartphone addiction. The study aims to analyze the usage patterns of smartphone users in Ibadan, Oyo State, Nigeria, from a geographical standpoint. Therefore, the research seeks to address the question: What are the spatial variations in smartphone addiction in Ibadan?

LITERATURE REVIEW: URBANIZATION, ENVIRONMENT AND SMARTPHONE ADDICTION

The Importance of Smartphones in an Urban Environment

According to Osuide and Dimuna (2005), the urbanization movement in many developing nations, notably Nigeria, has been accompanied by a lack of basic utilities and infrastructure. The increased demand for urban goods, which are becoming scarcer by the day, has caused the cost of living to rise in response to the fast growth in the population in urban centers (Awe and Akinluyi, 2022). However, smartphones play a vital role in urban life, providing tools and services that support the dynamic and fast-paced nature of urban centers. Smartphone use in urban centers is crucial for several reasons:

1. Data Collection and Urban Planning: The data generated by smartphone usage can be analyzed to understand urban patterns, such as traffic flows, public transportation usage, and service demand. This data aids urban planners in making informed decisions for city development and infrastructure improvements.

2. **Access to Information**: Smartphones provide immediate access to a wealth of information, including news, weather updates, traffic conditions, and emergency alerts. This is particularly important in urban areas where timely information can impact daily activities.

3. Transportation and Navigation: Urban centers often have complex transportation systems. Smartphones, through GPS and various transportation apps, help users navigate public transit, find the quickest routes, and access real-time traffic updates. Ride-sharing apps also offer convenient alternatives to traditional taxis.

4. **Economic Activity:** Smartphones enable participation in the digital economy, supporting e-commerce, online banking, and mobile payments. They also facilitate gig economy jobs such as delivery services, ride-sharing, and freelance work, providing income opportunities for urban residents.

5. Health and Safety: Health apps and telemedicine services accessible via smartphones allow urban dwellers to monitor their health, book appointments, and receive medical consultations remotely. Smartphones also enhance personal safety through emergency alert systems and safety apps.

6. Convenience and Efficiency: Smartphones enhance the convenience of daily life in urban centers by enabling online shopping, food delivery, and access to various on-demand services. They streamline tasks, saving time and reducing the need for physical errands.

7. Entertainment and Leisure: With access to streaming services, gaming, social media, and other entertainment apps, smartphones provide urban residents with diverse leisure options that fit into their busy lifestyles.

8. Smart City Integration: Smartphones play a key role in smart city initiatives, allowing residents to interact with urban infrastructure through apps for utilities, waste management, public transportation, and more. This integration promotes efficient urban management and improved quality of life.

9. Education and Learning: Smartphones provide access to online learning resources, educational apps, and virtual classrooms, making education more accessible and flexible for urban populations.

10. Communication and Connectivity: Smartphones facilitate instant communication, allowing residents to

stay connected with family, friends, and colleagues. They also support networking and community engagement through social media platforms and messaging apps.

The Smartphone Addition and Environment

Smartphone addiction is a behavioral condition characterized by an extreme focus on a smartphone through interactions on social media, playing games, or using other applications on the device. (Choi 2015) It is a reactive disorder that has a negative impact on the person's relationships with others and with the outside world. It is a reliance syndrome that causes nomophobia, or the dread of going without a smartphone.

The device used to access the Internet and its content is a smartphone. This item would be comparable to the glass in alcoholism or the needle in heroin addiction in terms of addiction to substances. Although the terms "needle addiction" (Levine, 1974) and "bottle addiction" are illustrative and widely used, the addiction is to the substance itself rather than the delivery method or container. Research on this topic has a propensity to treat smartphones as a single addictive substance, assessing the degree of "smartphone use" or "smartphone addiction," despite the fact that the device itself is the problem in the same manner as a drug is.

The physical portability of the smartphone makes problematic Internet behaviors (such as compulsive social media use, access to pornography, and gambling addiction) easier to engage in and thus increases their frequency of use, but the smartphone itself is not the issue. The activities a user engages in while using a smartphone, their motivations for doing so, and the satisfaction they derive from them all play a role in the issues that result from such use (Jeong, Kim, Yum, and Hwang, 2016; Lopez-Fernandez et al., 2017).

Rapid technological progress in the last century has left its impact on all parts of society. One of these technological advancements is the smartphone, with its plethora of applications providing instant access to the Internet and social media via platforms like WhatsApp, Facebook, Twitter, and Skype, as well as facilitating SMS and fax transfer and Internet accessibility. The smartphone also comes with entertainment features including games, the camera, video, Bluetooth, multimedia, radio, YouTube, movies, GPS, and other apps to which people have grown dependent (AboJedi, 2008). Smartphone tends to be an overused device because, unlike other devices such as desktop or laptop, they are quiet portable and mobile. One of the spectacular attributes of addiction is the uncontrollable fear of losing access to one's phone or not having connectivity. This form of anxiety is termed nomophobia which implies no mobile phone “phobia” (LaRose & Eastin, 2010; Griffiths, 2013; Oulasvirata et al., 2015).

Uninterrupted access to email, instant chats, and video, as well as the ability to download additional apps from the smartphone's source site, is one of the device's most significant benefits. The smartphone has supplanted the computer for some people. Others have found it to be the most effective kind of recreation, enjoyment, and pastime. Due to its widespread use, smartphones have grown to be seen as a sign of socioeconomic class and owning one is linked to a number of psychological and social ideas, such as the popularity implied by amassing a sizable number of friends or followers. Some claim, however, that the smartphone has more drawbacks than advantages. The negative effects stem from how smartphones are used, especially by youngsters and they differ across urban and rural space (Attamimi, 2011).

There is empirical evidence that most smartphone addicts are urban residents whose level of exposure and technological advancement encourage them to rely on smartphones in order to communicate with others without face-to-face encounters (Walsh, White, & Young, 2007).

Recently, Analysts have projected that over a third of the world’s population estimated at 2.53 billion will own a smartphone by 2018 while Smartphone shipments worldwide is expected to hit 1.71 billion by 2020. Likewise, Night time smartphone use resulted in their getting up late and those students report they cannot live without smartphones. In another study conducted in the US, 65% of the participants (N ¼ 1061) reported that they could not live without smartphones (Wajcman, Bittman, Jones, Johnstone, & Brown, 2007). Nearly 70 percent of Belarusian university students were convinced on the harmful effects of smartphone (Szpakow, Stryzhak, & Prokopowicz, 2011).

Smartphone Addiction Statistics

Recent analysts have projected that over a third of the world's population estimated at 2.53 billion will own a smartphone by 2018 while Smartphone shipments worldwide are expected to hit 1.71 billion by 2020. However, smartphone addiction has become perhaps the best test for bosses and representatives in the 21st century generally because of the inexorably customized nature of new gadget. The time spent using mobile devices has been shaping and impacting personal conduct norms around the world as an ever-increasing number of people choose cellphones over personal computers as their preferable work platform. The effects of smartphone and internet dependency on behavior, sound emotional health, and links to the workplace could have a significant impact on the growth, productivity, and progress of the functioning age population around the world. Technology addiction has roots in Internet addiction, which was first recognized in 1995 by American doctor Ivan Goldberg and in the paper "Internet addiction:

A smartphone uses the same technology as the Internet and is anticipated to have an impact that is at least as significant as the Internet. People who use smartphones more frequently develop a dependency on them and start to face related issues (Hong, Chiu, & Huang, 2012). The Diagnostic and Statistical Manual (DSM IV) (American Psychiatric Association, 1994) criteria for material abuse were used to develop the diagnostic criteria for smartphone addiction. The same diagnostic criteria are used to classify Internet and smartphone addictions as disorders. Because they struggle to restrain their smartphone use, those who suffer from this disorder struggle with social, psychological, and health issues (Heron & Shapira, 2004).Teenage smartphone users (15-24 years old) have reached 103 million in the US, Canada, the UK, Germany, and Italy. And 87% of youths in high school and college had smartphones (International Telecommunication Union (ITU) 2004). According to research by Klyoko and Hitoml from 2005, 49% of high school students have smartphones that they use more than ten times a day to communicate with friends and check their emails. These students report that they cannot live without cellphones due to their late-night smartphone use. 65% of participants (N 14 1061) in a different US survey stated they would be unable to function without cellphones (Wajcman, Bittman, Jones, Johnstone, & Brown, 2007). Approximately 70%of Belarusian university students were convinced on the harmful effects of mobile phone (Szpakow, Stryzhak, & Prokopowicz, 2011).

Urban Infrastructure and Socioeconomic Issues On Smartphone Addiction: The African Context

The widespread availability of smartphones, coupled with affordable data plans and extensive network coverage in urban areas, significantly heightens the risk of smartphone addiction. Public Wi-Fi and hotspots in these environments facilitate constant connectivity, further exacerbating this issue. In densely populated urban settings, feelings of loneliness and isolation are common, leading individuals to seek solace in excessive smartphone use. For people with lower socioeconomic status, smartphones can serve as a form of escapism and provide access to information and services that may otherwise be financially out of reach. Moreover, a general lack of education and awareness regarding smartphone addiction and its consequences contributes to its growing prevalence. Urban residents frequently grapple with high levels of stress and anxiety, which can drive them to use their smartphones excessively as a coping mechanism. Social media platforms, accessible on smartphones, often foster social comparison and a compelling fear of missing out, further fueling addiction. Consequently, urban dwellers, who may feel disconnected from their communities, frequently turn to their smartphones for social interactions and a sense of belonging.

Research indicates that developing ICT infrastructure in Africa is crucial for economic growth. A study by Andrianaivo and Kpodar from 1988 to 2007 showed that advancements in ICT, particularly smartphones, significantly boost economic progress. Although ICT represents a small part of the economy, it has become the main driver of improvements. Countries with substantial ICT growth also lead on the African Infrastructure Development Index (AIDI).

However, despite the rise in mobile usage and broadband speed, many African cities struggle to keep up with population growth. Currently, 87% of Africans lack internet access, which hampers connectivity and development. While mobile broadband penetration is expected to grow, it stood at only 3.8% in 2011, versus 54% in Europe.

The African Context

The demand for smartphones across Africa is immense and rapidly increasing. A review of the evidence reveals that in 2001, fewer than 3% of the population had access to a telephone. (Oyewusi & Ayanlola, 2014). However, the number of mobile subscribers has since surged to over 50 million, accounting for more than 7% of the population. This subscriber base is currently growing at an impressive rate of approximately 35% per year, a trend that is expected to persist in the coming years. This remarkable market expansion is closely tied to liberal regulatory environments that empower operators to respond effectively to customer needs. The industry recognises that companies that develop business models aimed at economically disadvantaged individuals will likely reach the next billion customers. This presents substantial opportunities for delivering essential services to those experiencing poverty.

In Africa, a significant number of low-income individuals depend on public facilities and often share mobile phones, which means that the low mobile density figures may not provide an accurate representation of telecommunications access among the poor. Andrianaivo and Kpodar, (2011) indicate that in typical rural districts, up to 80% of households regularly use mobile phones. The portability of mobile phones makes them particularly suitable for remote areas with insufficient infrastructure. The prepaid system, which utilizes low-denomination scratch cards, aligns well with the economic realities faced by many Africans. Mobile phones offer a cost-effective means of communication, especially through SMS and "beeping."

Although women encounter challenges in accessing mobile phones, evidence reveals that these devices are largely gender-neutral tools, predominantly used for social interactions such as chatting and maintaining connections. The advantages of mobile phone usage include enhanced well-being, time savings, more dynamic business transactions, improved financial management, and potentially increased household income. As a result, mobile phones have become an integral part of African culture, extending beyond the elite. While predicting future trends remains challenging, mobile voice telephony will likely converge with other digital technologies, facilitating access to a variety of data-driven services, such as agricultural and financial information, within the next decade. Smartphones are, therefore, becoming increasingly important to African countries:

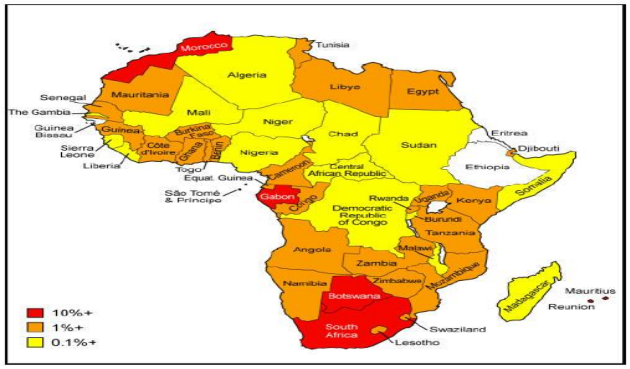
I. **As a Household Expenditure:** Mobile services help maintain social capital and play a vital role in economic management.

II. **As an Infrastructure Service**: Mobile technology enhances market efficiency, attracts investment, mitigates disaster risks, and fosters empowerment.

III. **As an Economic Sector:** Mobile operators can generate significant profits and contribute to government revenues through taxes.

IV. **As a Development Tool:** Case studies highlight innovative uses of mobile phones that improve service delivery for underserved communities (e.g., providing weather information and market prices) and create opportunities for new services, such as disease tracking.

Figure 1 Penetration Rates in Africa (%)



Source: http://cellular.co.za/stats/stats-africa.htm

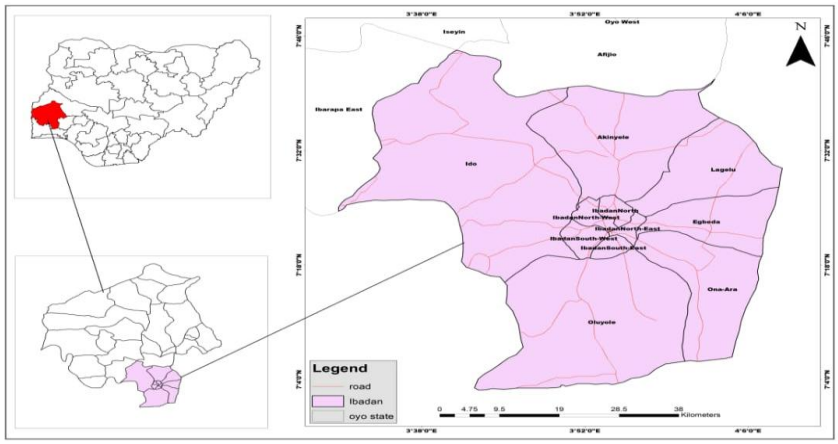
The Study Area

Ibadan is situated between longitudes 3º 450E and 4o 000E and latitudes 7º 150N and 7º 300N of the equator. Geographically, Ibadan is situated in south-western Nigeria, close to the border between forests and grasslands. The administrative center of Oyo State is currently located in the metropolis of Ibadan. Five of the eleven local government areas that make up the Ibadan region Ibadan North, Ibadan Northwest, Ibadan Northeast, Ibadan Southeast, and Ibadan Southwest are generally regarded as the Ibadan metropolis. The remaining six local government areas are peri-urban or rural, and they are Egbeda, Akinyele, Ona-Ara, Oluyole, Lagelu, and Ido. The city was once the biggest in tropical Africa for a very long time.The city was for a long time the largest in tropical Africa (Oguntoyinbo, 1982).

It is situated on a topographically rough terrain, with a central ridge cutting through the city. The city has an average elevation of 210 meters above sea level, with elevations ranging from 150 meters in the valley to 275 meters. (3,080km2) is the total area of the city (Oguntoyinbo, 1982; Adebayo, 1985). Ibadan is the largest indigenous metropolitan area in sub-Saharan Africa (Areola, 1994; Adedimeji et al., 2008). Ibadan's population grew from an estimated 170,000 in 1911 to 459,196 in 1952. By 1963, its population had reached 625,000. The 1991 census puts the population of the city at about 1.45 million people. Altogether, the region of Ibadan has a population of over 2,455,766 persons according to the 2006 population census. The Ibadan metropolis local government areas account for 1,338,659 persons, while the six other local government areas that constitute the rest of the region account for slightly less than one-third of the population of the state (National Population Commission, 2006).

The climate is equatorial notably with dry and wet seasons and with high humidity. The wet season last between April and October during which there is rain and the dry season with no rain from November to March. The rainfall ranges from about 900mm. The average minimum daily temperature throughout the state ranges between 25.00c while the maximum average temperature ranges from 300c to 350c. The mean temperature is about 300c (min) and 350c (max). The main economic activity is agriculture which includes farming, hunting, and local craft businesses. The common food crops grown in the area include cassava, maize, yam, vegetables, melon, guinea corn, pawpaw, etc. The agricultural practice involves the use of old crude tools such as cutlasses, hoes, axes, and so on. It is also famous for carved calabashes (gourds), leatherwork (especially cushions) in goatskin and sheepskin, wood carving, and mat making. The larger percentage of the land is mainly for agriculture, which is restricted to small-scale farm holdings while part of the land is occupied by the nomadic herdsmen where they carry out their pastoral activities.

Figure 1.0: Show the Map of Ibadan, Oyo-State



THE RESEARCH METHODOLOGY

This study adopted a survey method of data collection. Through the primary method of data collection. A cross-sectional questionnaire survey was obtained in all eleven local government areas of Ibadan See the result as displayed in table 2.0. Population data was assessed through secondary data from the National Population

Commission (National Bureau of Statistics). The questionnaire was divided into three main sections. Section A contained information on the location and demographic characteristics of the respondents. Section B encompassed the Smartphone Addiction Scale (SAS) Questionnaire, which consists of 33 questions for each item of six factors: daily life disturbance (5 items), cyberspace relationship (5 items), withdrawal (6 items), positive anticipation (6 items), tolerance (5 items), and overuse (6 items). Each question asked the participants to express their opinion on a 6-point Likert scale ranging from coded 6 (Strongly Agree) to 1 (Strongly Disagree). The maximum score for this scale is 198. Since the lowest score that can be obtained from the smartphone addiction scale was 33 and the highest score was 198, the levels of smartphone addiction were defined in Table 1.0. The SAS helps elaborate in detail on the usage of smartphones among users, allowing degrees of opinion to determine addiction levels. However, a limitation of the SAS is the mathematical computation for users and respondents to comprehend. The measurement can also be manipulated, as personal information could be avoided by respondents. Section C contains information on the effects of Smartphone Addiction on users using both open and closed-ended structured questions.

The population of Local Government Areas obtained from 1991- 2022 Population census of Nigeria would be projected. Given the survey of the sample size, it is projected that four hundred (400) questionnaires will be administered. The projection would be calculated using the below formula while Taro Yamen method was adopted to calculate the sample size. It is expresses as

P (n) =P (o) (1+r) ^n. Where P (n) = base population for the year (1991) r= population growth rate (2.3%), n= number of years. P (n) = (1+2.3%) ^31

P (n) =1,834,300 (1+0.023) ^31

P (n) = 1,834,300 (1.023) ^31. P (n) = 1,834,300 (2.023). P (n) = **3,710,788**

The above projection was calculated for the (11) Local Government Areas in Ibadan.

Using the formula below **n=N/1+N (e)*2.** n=sample size N= total population e= level of significance

n= 3,710,788\1+3,710,788 (0.05)*2. n= **400.**

Method of Data Analysis

To analyze the spatial variations in smartphone addiction in Ibadan, the developed smartphone addiction scale (SASQ) was used to determine its variations across Ibadan. The results are presented as cross-tabulations to showcase the current variables and their variation in the study area. Maps were used to display the variations in smartphone addiction observed in each Local Government Area in Ibadan and gender differences. Global Moran's I was used to test the hypothesis stating that there is a significant spatial variation in Smartphone addiction in Ibadan.

RESULTS AND DISCUSSION

Socio-Demographic Characteristics of Respondents

Table 3.0 shows the frequency and percentage distribution of the respondents by gender, age, educational qualification, occupation, family size, and average monthly income. The majority of the respondents were male (52%), aged between 25 and 64 years (55%), had tertiary education (76%), and were engaged in business (31%) or civil service (24%). The average family size was 1-5 members (74%), and the average monthly income ranged from below 30,000 naira (35%) to above 100,000 naira (20%).

Table 1.0: Summary scores for Smartphone Addiction Levels

S/N	Smartphone Addiction Scores	Remarks
1.	33-98	Low level

2.	99-131	Moderate
3.	132-164	High Risk
4.	165-198	Addicted

Source: Author's Computation

Table 2.0 Administration of Questionnaire by LGA

S/n	LGAs	Headquarters	Population census (1991)	Population Projection (2022)	Percentage Population	Sample size n/3,710,788x400
1.	North	Agodi	302,271	611,494	16.48	66
2.	North east	Iwo road	275,627	557,593	15.03	60
3.	Northwest	Dugbe	147,918	299,238	8.06	32
4.	Southeast	Mapo	225,800	456,793	12.31	49
5.	Southwest	Aleshin	277,047	560,466	15.10	60
6.	Akinyele	Moniya	140,118	283,458	7.64	31
7.	Egbeda	Egbeda	129,461	261,899	3.76	15
8.	Lagelu	Iyana Offa	68,901	139,386	7.06	28
9.	Ona Ara	Akanran	265,571	248,926	4.99	19
10	Oluyole	Idi Ayunre	91,527	185,159	6.71	26
11	Ido	Ido	52,582	106,373	2.86	14
	Total=		**1,834,300**	**3,710,788**	**100**	**400**

Source: National Population Commission, Bureau of Statistics and Authors Computation

Gender Differences in Smartphone Addiction

The danger of smartphone addiction is depicted on the map below for both sexes throughout all local government areas in Ibadan. The findings indicate that, throughout the LGA, women are at a higher risk of developing smartphone addiction than men, with the exception of Ona Ara and Ibadan North West. As a result, the study's findings indicate that women in Ibadan have a higher risk of smartphone addiction than men do. However, the researcher observed that women relied more heavily on their smartphones than men for online business transactions as they are likely to be engaged in small scale businesses and with entrepreneurs. Likewise, women engaged more in social interaction and social networking such as Twitter, Facebook, WhatsApp, and Instagram e.t.c girls are more likely to use smartphones excessively (Choi et al., 2015; Kwon & Paek, 2016; Lee et al., 2017). Although it is unclear about the difference between the addictions, it was suggested that women have a narrower range of uses for the phone, such as chatting, blogging, updating personal homepages, and searching for information, but are more highly dependent on their smartphone (Heo, Oh, Subramanian, Kim, & Kawachi, 2014). Entertainment is a key driver for smartphone users since they find using their devices pleasurable and fun (Kwon and Chidambaram 2000). See the result as displayed in table

4.0.

Table 3.0: Socio-Demographic Characteristics of Respondents, (Field Work, 2023)

Social demographic variables		**Frequency**	**Percentage**
Gender	Female	194	49%
	Male	206	52%
Age	15-24	2	1%
	18-24	125	31%
	25-64	219	55%
	Above 65	54	14%
Educational Qualification	Primary	9	2%
	Secondary	91	23%
	Tertiary	300	75%
Occupation	Artisan	60	15%
	Business	125	31%
	Civil Servant	95	24%
	Professional	13	3%
	Student	27	7%
	Unemployed	80	20%
Family Size	10 and above	7	2%
	1-5	295	74%
	6-10	98	25%
Average Monthly Income	Below 30,000	141	35%
	30,000-50,000	88	22%
	50,000-100,000	90	23%
	100,000 and above	81	20%
Total		**400**	**100%**

Table 4.0: Gender Differences in Smartphone Addiction

Risk category	**Male**	**Female**	**Total**
Low level	43(75.4%)	14(25.6%)	57(100%)

Moderate	84(50.9%)	81(49.1%)	165(100%)
High risk	66(46.5%)	76(53.5%)	142(100%)
Addicted	13(36.1%)	23(63.9%)	36(100%)
Total	206(51.5%)	194(48.5%)	400(100%)

Source: Field Work, 2023

Levels of Smartphone Addiction of the Respondents across the LGAs

The respondents' degrees of smartphone addiction varied across LGAs as shown in table 5.0 The data demonstrates that the vast majority of respondents from each local government fall are moderate smartphone users. With 63.6% of its residents moderately using smartphones, Ido Local Government has the largest proportion of moderate smartphone users, followed by Oluyole Local Government with 53.8%. With only 26.3% of respondents using their smartphones significantly, Ona Ara Local Government has the lowest percentage of respondents who use their phones regularly.

Ona Ara Local Government has the greatest percentage of respondents who use smartphones frequently (57.9%), while Southeast Local Government has the second-highest rate (46%) of respondents having high levels of smartphone usage. With only 18.2% of respondents reporting high levels of smartphone use, Ido Local Government has the fewest respondents at high risk of addiction and the most moderate smartphone usage. With around 28.1% of respondents reporting a smartphone addiction, the Northwest Local Government has the greatest rate of hooked smartphone users, followed by the Southwest Local Government with 20.3%. While Oluyole and Ona Ara local governments do not have a sizable proportion of addicted smartphone users, Ido local government has the lowest percentage of smartphone users, with only 9.1% being addicted users.

However, the results summarize that urban residents recorded the highest level of addiction and were at a high risk of addiction compared to rural residents of the study area. Therefore, most smartphone addicts are urban residents whose level of exposure and technological advancement encourage them to rely on smartphones in order to communicate with others without face-to-face encounters (Walsh, White, & Young, 2007). Likewise, the device is a replacement for both big and small-scale businesses such as online shopping and other financial transactions that people engage daily. It is also natural that smartphones are not evenly distributed such that urban residents are more likely to own a smartphone compared to rural residents. Urban residents may likely have access to their smartphones compared to rural dwellers as a result of good internet service providers for fast internet connection, unlike rural dwellers who could find it difficult to access the internet for their daily activities. The reasons why some LGAs have higher addiction than others were observed, Business, social, and other economic activities are more concentrated within these areas, likewise, the level of interaction using smartphones cannot be compared to other LGAs, professionals, and individuals with different educational qualifications are also located in these areas. It was also observed that students who engaged in both work and study due to proximity to their various institutions are also located in these areas. It was also observed that respondents in these LGAs are more independent who rely on their smartphones as a means of surviving for daily income.

Table 5.0: Spatial variation in Levels of Smartphone Addiction of the Respondents across the LGAs

Local Government Areas	Low level	Moderate	High Risk	Addicted	Total
Akinyele	5 (16.7%)	12 (40%)	11 (36.7%)	2 (6.7%)	30 (100%)
Ido	1 (9.1%)	7 (63.6%)	2 (18.2%)	1 (9.1%)	11 (100%)
Egbeda	2 (13.3%)	5 (33.3%)	6 (40%)	2 (13.3%)	15 (100%)

Lagelu	4 (14.3%)	14 (50%)	8 (28.6%)	2 (7.1%)	28 (100%)
North	11 (16.9%)	25 (38.5%)	27 (41.5%)	2 (3.1%)	65 (100%)
Northeast	12 (20%)	24 (40%)	21 (35%)	3 (5%)	60 (100%)
Northwest	-	16 (50%)	7 (21.9%)	9 (28.1%)	32 (100%)
Oluyole	3 (11.5%)	14 (53.8%)	9 (34.6%)	-	26 (100%)
Ona Ara	3 (15.8%)	5 (26.3%)	11 (57.9%)	-	19 (100%)
Southwest	12 (18.8%)	22 (34.4%)	17 (4.3%)	13 (20.3%)	64 (100%)
Southeast	4 (8%)	21 (42%)	23 (46%)	2 (4%)	50 (100%)
Total	57 (14.25%)	165(41.25%)	142 (35.5%)	33 (8.25%)	400 (100%)

Source: Author's Analysis, 2023

Figure 2.0: Spatial pattern of Smartphone Addiction for Male (Addicted)

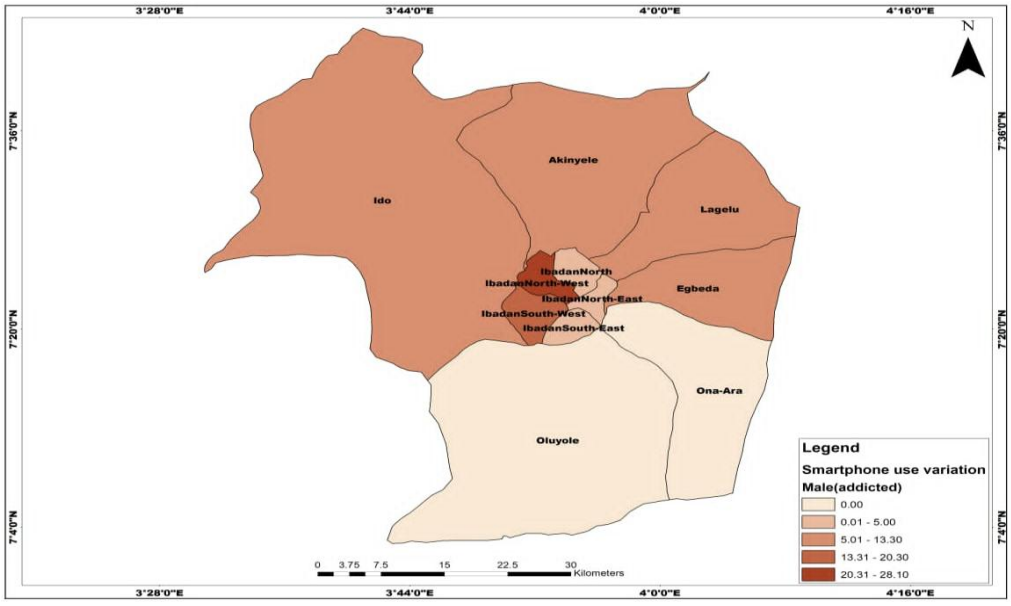


Figure 3.0: Spatial pattern of Smartphone Addiction for Male (High risk)

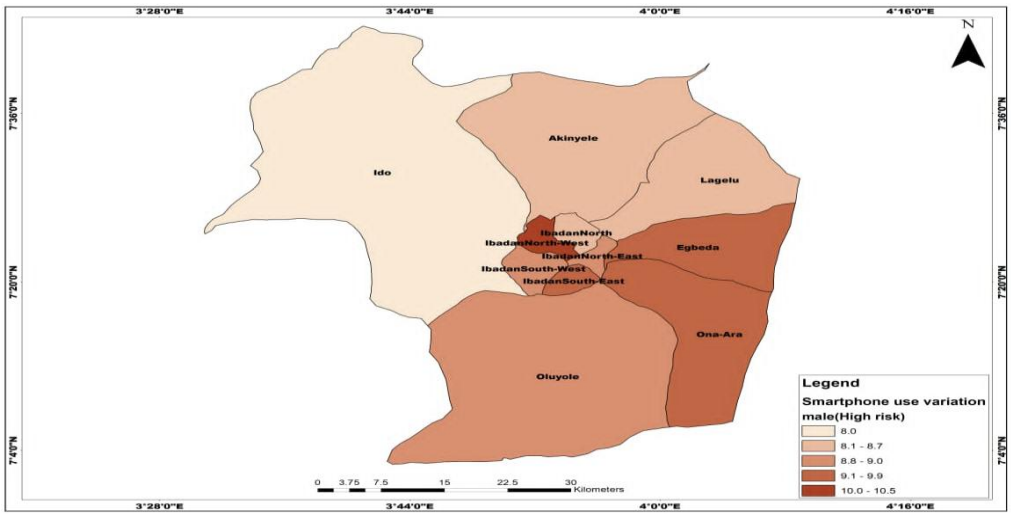


Figure 4.0: Spatial Pattern of Smartphone Addiction for Female (Addicted)

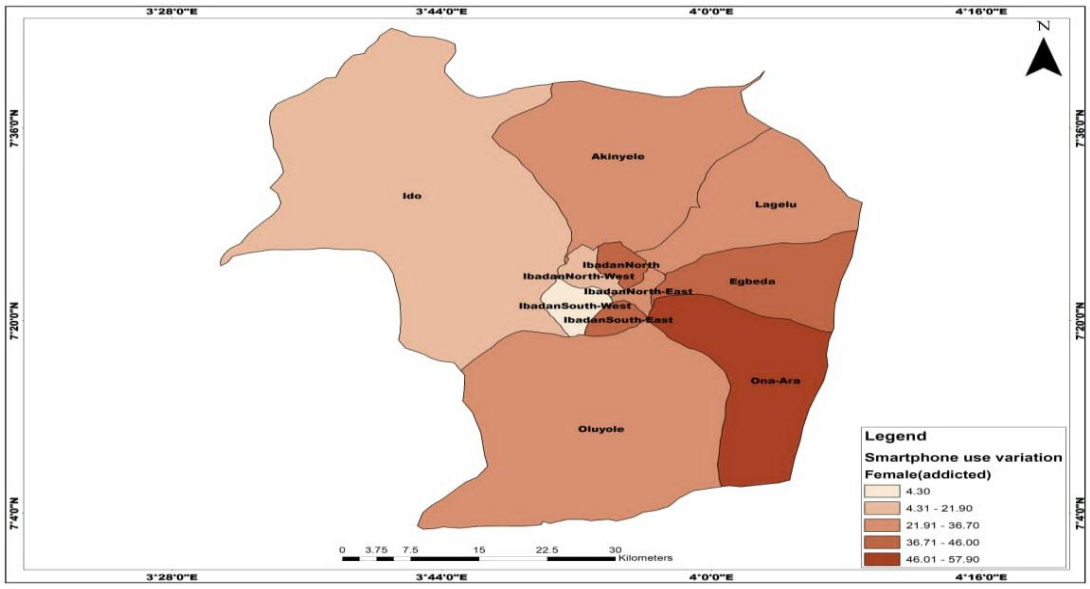


Figure 5.0: Spatial pattern of Smartphone Addiction for Female (High risk)

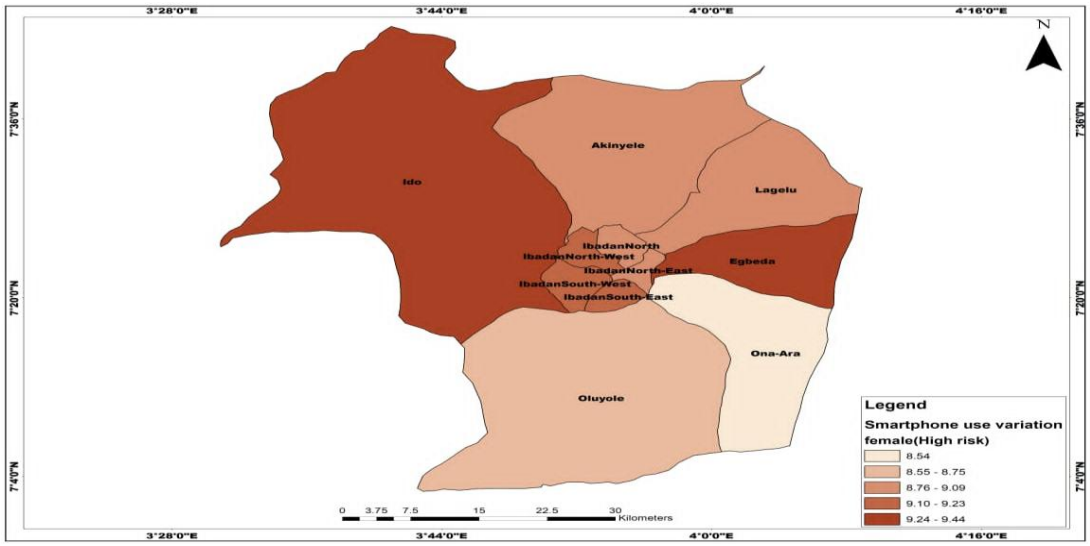
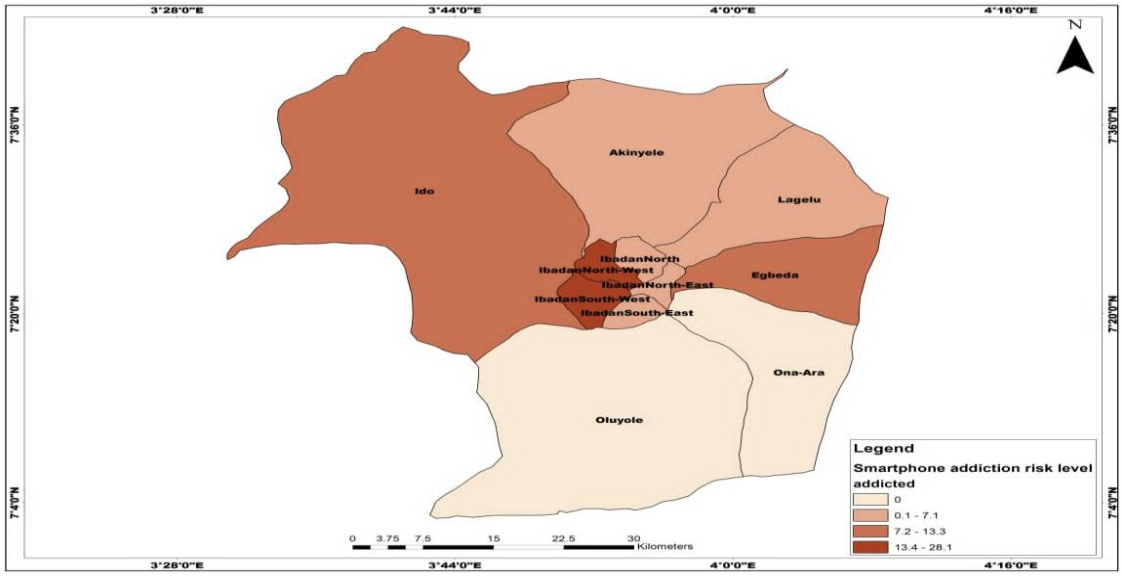


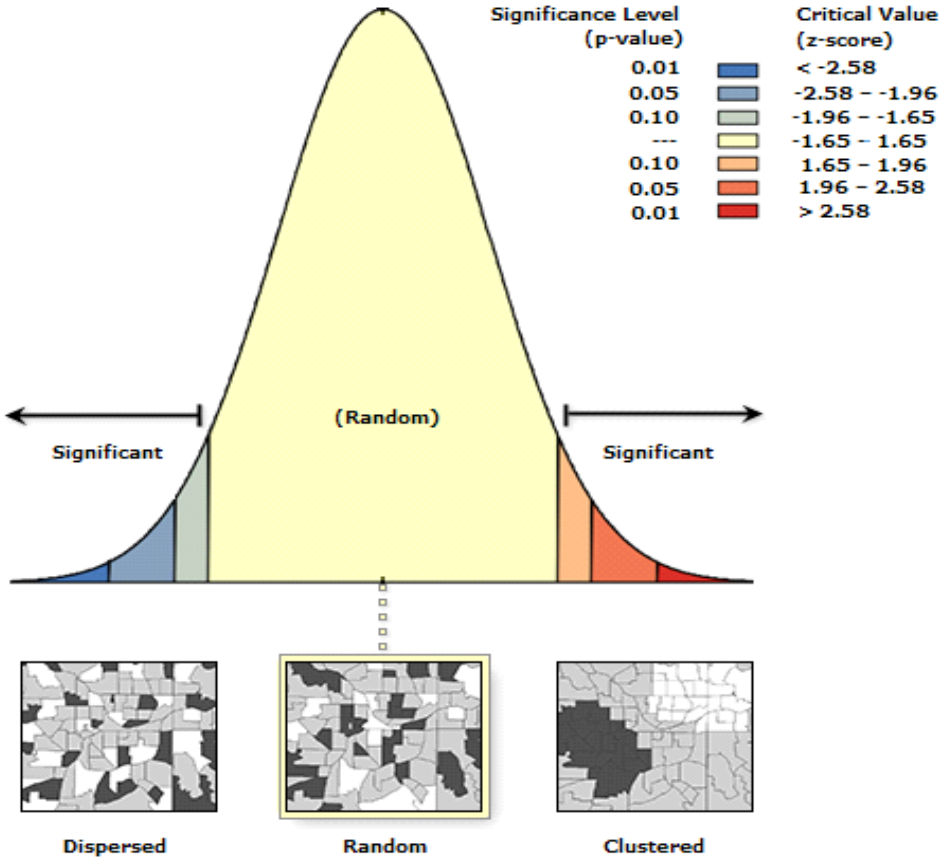
Figure 6.0: Spatial pattern of Smartphone Addiction across the Local Government Area (Addicted)



Spatial Autocorrelation of Smartphone Addiction in Ibadan

The Moran's Index ranges from -1 to 1, with values close to -1 indicating negative spatial autocorrelation, values close to 1 indicating positive spatial autocorrelation, and values close to 0 indicating no spatial autocorrelation. The p-value of 0.045065 is less than 0.05, indicating that there is some evidence of spatial autocorrelation in the data. However, the z-score of -0.115299 suggests that the observed Moran's I value is relatively close to the expected value. This means that the evidence for spatial autocorrelation may be weak or marginal. P value of 0.045065 shows that p-value is statistically significant while the Z score is negative -0.119266. However, whenever the p value is statistically significant and the Z score is negative, we reject the null hypothesis and accept the alternate hypothesis. In this case, we accept the alternate hypothesis which states that there is significant variation in smartphone addiction among users. See figure 4.6

Figure 4.6: Global Moran's i results of Smartphone Addiction Distribution



Nearest Neighbour analysis

Moran's Index: -0.115299

Z-score: -0.119266

P-value: 0.045065

Source: Author's Analysis, 2023

Summary

Analyzing geographic differences and looking into what causes smartphone addiction were the primary objectives of this study. A suitable tool (the Smartphone Addiction Scale Questionnaire, or SASQ) was used to determine the spatial variation among the local government areas. Global Moran's was used to test hypothesis one at a 0.05 level of significance. The result of testing hypothesis one with Z-score -0.119266 and p-value

0.045065 for Ibadan shows that there was significant spatial autocorrelation of Smartphone Addiction across the LGAs and is likely due to random chance. The variation was caused by the questions asked, particularly the frequency/hours per day an individual tends to use a smartphone and the overall amount of time they spend online over a specific period. Similarly, the Smartphone Addiction Scale questionnaire (SASQ) data indicated that all 11 LGAs in Ibadan had higher scores for the degree of addiction. The findings indicated that women in Ibadan have a higher risk of smartphone addiction than men do. According to empirical data, urban dwellers are more likely to be smartphone addicts than rural ones because of their exposure to technology and desire to communicate with others virtually since both sexes engage in the majority of social interactions (Wash, White & Young, 2007).

CONCLUSION

The study's results indicated that smartphone addiction was more prevalent than average across all LGAs. All of the LGAs exhibit a severe level of smartphone addiction, however, it can be declared with certainty. Ibadan Northwest reported the greatest level of addiction, it was discovered. It is also natural that smartphones are not evenly distributed such that urban residents are more likely to own a smartphone compared to rural residents. Urban residents may likely have access to their smartphones compared to rural dwellers as a result of good internet service providers for fast internet connection, unlike rural dwellers who could find it difficult to access the internet for their daily activities.

Further research on this study discusses the correlation with model formulation to better understand the significance of gender differences in smartphone addiction.

RECOMMENDATION

- The demand for people to spend more time on other important activities that provide value to their respective lives should be considered to reduce this behavioural attitude.
- More job opportunities can be created by the government, and private businesses and both can be useful in keeping people engaged, which will likely reduce smartphone addiction.
- Additionally, psychologists are urged to change people's thoughts, attitudes, and actions around smartphone use.
- Finally, smartphone users should make the most of the good influences their devices can have on their life and focus on useful rather than pointless activities when using them.

REFERENCES

1. Abo-Jedi, A. (2008). Cellphone addiction and its relation to self-closure in a sample of Jordanian university and Amman private university students. The Jordanian Journal for Educational Sciences, 4, 137e150.
2. AfDB, “The Africa Infrastructure Development Index (AIDI) 2020,” 2020. [Online]. Available: www.afdb.org.
3. AfDB, “An assessment of Progress towards the Connect Africa Summit Goals,” 2013. [Online]. Available: www.afdb.org.
4. Akinluyi, M.L & Adedokun, A. (2014). Urbanization, Environment and Homelessness in the Developing world: The Sustainable Housing Development. Mediterranean Journal of Social Sciences. Vol 5 No 2, Pp-261-271, E-ISSN 2039-2117, ISSN 2039-9340. MCSER Publishing, Rome-Italy. January
5. Andrianaivo,M. and Kpodar, K. (2011). “ICT, Financial Inclusion, and Growth Evidence from African Countries,” Working Paper 73, pp. 1-44, 2011. Doi: 10.5089/9781455227068.001.
6. Awe F. C. and Akinluyi M. L. (2022). Urbanization and Housing Typologies in an Urbanizing City: Ado-Ekiti, Nigeria as a Case Study. International Journal of Architecture, Arts and Applications. Vol. 8, No. 2, 2022, pp. 91-99. doi: 10.11648/j.ijaaa.20220802.16.

7. Attamimi, A. (2011). The reasons for the prevalence of BlackBerry cellphones and the resulting educational effects from the perspective of secondary school students in Abo- Dhabi.
8. Choi, N. (2015). The Effects of a Smartphone Addiction Education Program for Young Adult Females. International Journal of u-and e-Service, Science and Technology, 8(12), 277-284.
9. Don R (2012). Worldwide Smartphone User Base hits 1 billion. CBS Interactive
10. Griffiths MD (2013) Social networking addiction: emerging themes and issues. J Addict Res Ther 4:e118. doi:10.4172/2155-6105.1000e118.
11. Gupta N, Garg S, Arora K (2016),Mustafi et al.,2017 Pattern of mobile phone usage and its effects on psychological health, sleep, and academic performance in students of a medical university.; Natl J Physiol Pharm Pharmacol; 6(2):132-139
12. Heo, J., Oh, J., Subramanian, S. V., Kim, Y., & Kawachi, I. (2014). Addictive internet use among Korean adolescents: https://doi.org/10.1371/journal.pone.0087819.
13. Hong, F., Chiu, S., & Huang, D. (2012). A model of the relationship between psychological characteristics, mobile phone addiction and use of mobile phones by Taiwanese university female students. Computers in Human Behavior, 28, 2152–2159. https://doi.org/10.1016/j.chb.2012.06.020.
14. Kim, Y., Jeong, J. E., Cho, H., Jung, D. J., Kwak, M., Rho, M. J. … Choi, I. Y. (2016). Personality factors predicting smartphone addiction predisposition: Behavioral inhibition and activation systems, impulsivity, and self-control. PLoS One, 11(8), e0159788. https://doi.org/10.1371/journal.pone.0159788.
15. Kuss DJ, Griffiths MD, Karila L, Billieux J (2014). Internet addiction: a systematic review of epidemiological research for the last decade. Curr Pharm Des; 20(25):4026-4052.
16. Kwon, Hyosun Stella, and Laku Chidambaram. 2000. A test of the technology Acceptance model: The case of cellular telephone adoption. Paper presented at the 33rd Annual Hawaii International Conference on Sciences, Maui, HI, USA, January 6; Hoboken:IEEE, pp. 7–16.
17. LaRose R, Eastin MS (2010). A social cognitive theory of internet user and gratification: towards a new model of media attendance. J Broadcasting Electronic Media. 48(3): 358 377.
18. Mabogunje, A. (1985). Towards an urban policy in Nigeria, Onibokun P. (Ed), Housing in Nigeria, A book of readings, Ibadan, NISER.
19. Oguntoyinbo, J.S. (1982). The climate of Ibadan. In: Filani, M.O., Akintola, F.O., Ikporukpo, C.O. (eds) Ibadan Region. Department of Geography, University of Ibadan. Special Silver Jubilee (NGA) publication, pp. 16-40 (New Impression, 1986).
20. Oulasvirata A, Rattenbury T, Lingyi M, Raita E (2015). Habits make smartphone more pervasive.http://www.techdirt.com/articles/201 00607/0224269710.shtml. Accessed 02/04/2018.
21. Osuide S. O. and Dimuna K. O. (2005). Effects of Population Growth on Urbanization and the Environment in Nigeria. pp. 27-33. In: Proceeding of year 2000 National Seminar on Population, Growth, Architecture and the Environment. Osuide SO (Ed.). Rasjel Publishers.
22. Oyewusi, F., & Ayanlola, A. (2014). Effect of Mobile Phone Use on Reading Habits of Private Secondary School Students in Oyo State, Nigeria. School Libraries Worldwide, 20(1), 116-127.
23. UN-Habitat (2006). State of the world's cities 2006/2007, The Millennium Development Goals and Urban Sustainability, London.
24. Walsh, S., White, K., & Young, R. (2007). Over-connected? Qualitative exploration of the relationship between Australian youth and their mobile phones. Adolescence Journal, 15, 122e135.
25. Wei Ran. 2008. Motivations for using the mobile phone for mass communications and entertainment. Telematican and Informatics 25: 36–46.