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The effects of digital inclusion and ICT access on the quality of life: A global perspective

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ABSTRACT

The role of Information Communication Technologies (ICTs) on the quality of life (QoL) has garnered much research interest recently given the pervasiveness of ICTs in our daily lives. However, whilst the evidence on the effects of ICTs in improving QoL at the individual country level is mixed, the evidence at the global level has not also been fully understood. Besides, the evidence on the linkages between ICTs, digital inclusion, and QoL has been underexplored in information systems research. Even though existing empirical research has largely provided specific results using single country data, there remains a gap in our understanding of the dual effects of digital inclusion and ICT access on QoL and the mediating role of ICT usage at the global level. This study seeks to address these by relying on secondary data from 121 countries for 2018 and structuration theory as a theoretical lens. The results from our PLS-SEM analysis show that digital inclusion and ICT access significantly influence QoL at the global level. Furthermore, our results show support for the mediating effects of ICT usage on the linkages between digital inclusion and QoL. The findings from this study provide key insights that explain how QoL may be enhanced through ICTs.

1. Introduction

Information Communication Technologies (ICTs) especially the Internet and the web has changed every aspect of human life. These ranges from individual social life to health outcomes and from the modernization of industry to the economic growth of nations [31,43]. At the individual level, people's yardstick of their wellbeing differs depending on their society's development [9]. For instance, in developed countries higher-order needs such as social, esteem, and self-actualization are more important for individual wellbeing than in developing countries where biological and safety-related needs are more critical [51]. Today, technology has not only become critical to our wellbeing but the opportunities it presents to expanding the possibilities of having a good life have made it somehow a necessity. This is to the extent that, in many parts of the world, and many aspects of our life, our quality of life (QoL) depends on it. Research interest in QoL has in recent times seen encouraging growth [58]. This is partly due to the introduction of the Sustainable Development Goals (SDGs) (UN, 2015) that highlights the key role ICTs can play in enhancing QoL and subsequently SDGs. QoL refers to the quality of a person's entire life, not just some parts [23]. A measure QoL must, therefore, include the state of being in various life forms such as quality of work-life, leisure life, family life, community life, and so on [51]. Several indexes have been used to measure the QoL, the most recent is that from the Network Readiness Index [17] which takes into account, happiness, freedom to make life choices, income inequality, and healthy life expectancy at birth. Whilst the NRI provides a picture of the QoL in 121 countries individually, a global picture of how ICTs impact on the QoL generally is missing.

When there is a disparity in the access to ICTs and its related benefits some people may be said to be digitally excluded and this may affect their QoL. Kaplan [32] describes digital inclusion as citizens' inclusion in the information society at various levels through technology either directly or indirectly to enhance their QoL. Therefore, digital inclusion is the activities through which citizens and disadvantaged groups have access to, and skills to use ICTs to enable them to take part in and enjoy their lives to the fullest in today's information society. From our literature review of studies in the information systems field regarding ICTs and the QoL, the evidence shows a dearth of studies providing a global view of the effects of ICTs on the QoL. Considering the salient role ICTs play in an individual's daily life, an examination of the dual effects of digital inclusion and ICT access is critical. Outcomes from existing empirical studies reveal digital inclusion, access to ICTs, physical and

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mental health conditions as key determinants of QoL [4,21,34,52]. Similarly, extant literature has argued that, for ICTs to achieve national accessibility, it is prudent for governments and appropriate agencies to ensure that, the needed infrastructure is put in place to allow individuals easily use these ICTs [8]; [39]. Therefore, it is imperative to examine the mediating role of ICT usage on linkages between ICT access and QoL as well as ICT usage on the nexus between digital inclusion and QoL. This is because, if a country does not embrace and use ICTs, they become digitally excluded because they will not be able to access conventional mainstream information sources [7,15]. Relying on this motivation and following the conceptual framework grounded on structuration theory [22], this study aims to examine the effects of digital inclusion and ICT access on QoL on one hand and the mediating effects of ICT usage on the other hand at the global level. To achieve our setout aim, two research questions are laid:

a. *What are the effects of digital inclusion and ICT access on QoL?*
b. *What are the mediating effects of ICT use on the relationship between digital inclusion, ICT access, and QoL?*

To the best of our knowledge, this study is the first to examine these linkages in one model at the global level using archival data sources. This study, therefore, makes some key additions to the literature. First, unlike existing studies, we examine the dual effects of digital inclusion and ICT access on QoL at the global level. Second, examining the mediating role of ICT usage on the relationship between digital inclusion, ICT access and QoL provides invaluable insight into the mediating effects of ICT usage on enhancing QoL at the global level. Furthermore, relying on a global dataset means that, we can make global generalizations of our findings, unlike previous literature that has mostly been conducted in a single country. The use of secondary data sources offers key merits such as; i) eliminating common method bias (Woszczynskia & Whitman, 2004), ii) easy duplication and iii) easy generalizability (Jarvenpaa, 1991). Finally, using the structuration theoretical lens means that we can provide key insights in an unparalleled way to explain how individuals' QoL may be enhanced through the interaction of agency and structure. The findings from this study are expected to be of key essence to practitioners and policymakers.

The remainder of this study is structured as follows: Sections 2 and 3 provide an overview of structuration theory and a review of the hypotheses. Section 4 specifies the methodology including a description of the sources of data. Section 4 presents the analysis of data that was done in line with PLS-SEM. Section 5 provides a discussion of the results, and the final section concludes the study by pointing out its limitations, future research directions, and policy implications.

2. Structuration theory

According to structuration theory, social actions and practices are the outcomes from the interaction of structure and agency [22]. Structure refers to the things that give form and shape to social life, but it is not itself the form and shape. Structure occurs only in and through the activities of human agents [22]. [22] further contends that agency does not only pertain to the intentions of individuals in doing things but instead, the flow or patterns of people's actions. Thus, agency is how able people's actions can define outcomes. The interaction between individuals and society is a core concern of structuration theory (i.e., agents and structure). Structure is not independent of agency, nor is agency independent of structure. Rather, human agents rely on structures in their actions, and at the same time, their actions serve to produce and reproduce structures [22].

We draw on both constructs, that is, agency and structure, to examine the linkages between digital inclusion, ICT access, and QoL. We argue that social structures in the form of mobile tariffs, internet access, etc., determine human agents' access to ICTs. Similarly, social structures determine the level of digital inclusion and QoL of human agents via e-participation, availability of local online content, income inequality, etc. However, human agents on their own free will have the freedom to use various ICTs which they deem appropriate to enhance their QoL. Therefore, the interaction between the two (i.e., human agents and social structures) is key to enhancing the QoL.

3. Literature and hypothesis development

The ubiquity of ICTs and its effect on human lives is profound [40]; [47], ranging from the effects of wearable technologies on personal lives to the effects of legacy systems on national productivity. Though every aspect of human life is affected by ICTs, the evidence on the role of ICTs in enhancing QoL of lives is mixed [5]. Despite these, ICTs continue to play a critical role in people's lives. Though existing studies have sought to identify several determinants of the QoL, the mixed nature of the evidence in terms of the nexus between ICTs and QoL deserves further examination. To add to this discourse, we hypothesis that:

H0. ICTs positively influence the QoL

Based on this general hypothesis we specifically develop the underlying hypotheses following our hypothesized model and supported by evidence from the literature. In the ensuing paragraphs, we present the specific hypothesis.

3.1. Digital inclusion and QoL

The potential merits of increased digital inclusion can be vast. This may include a reduction in social isolation, IT-enabled contact with friends and family, active involvement in an increasingly computerized healthcare system, sustained independence, and enhanced cognitive skills (Niehaves & Plattfaut, [41]; [56]. Srivastava & Shainesh [53] contends that digital inclusion may enhance sustainability in governments' provision of services to the elderly. Holgersson et al. [29]; Madon, Reinhard, & Walsham [38]; further point out that digital inclusion in the developed countries is more advanced than in the developing countries primarily due to the extensive digital infrastructure, improved access to ICTs, and enhanced digital skills of citizens. Notwithstanding these vast benefits of digital inclusion, the evidence of the effects of digital inclusion on QoL is not yet fully understood. The findings from the study of Afshar, Alam, Taylor, & Rafiq [4] show that digital inclusion can predict the QoL of people in Australia. However, the non-generalizability of their findings to the global context means there exists a gap future research needs to fill. Furthermore, the authors recommended future research to measure digital inclusion with other variables as their measurement of digital inclusion was only limited to broadband internet access. Hence the hypothesis;

H1. Digital inclusion positively influences the QoL

3.2. ICT access and QoL

QoL can be referred to as the global assessment of a person's satisfaction with his or her life based on his/her criteria [1]. Over time, the term QoL has evolved from being a social scientific index relating to the well-being of populations to an individual aspect of the modern psyche [21]. Thus, the term QoL in present days has been individualized rather than generalized to a population and as a result, has given birth to some difficulties in evaluating it in the same way for everyone [16,21]. Notwithstanding, the literature suggests that ICTs are likely to have beneficial effects on an individual's QoL [8,13,20,34,42]. For instance, Chaumon et al. [13] conducted a study analyzing the effects of ICTs on the QoL of elderly adults living in residential homes and points out that the use of ICTs have a positive impact on the QoL of elderly adults as they can connect with family and friends via the use of ICTs. They further point out that ICTs do not only provide individuals with new skills and capacities to perform tasks but also supply individuals with

new meaning and the prospects of achieving their goals. Also, Kivunike et al. [34] in their study highlights the key role of individuals access to ICTs on improving the QoL of citizens in rural communities in Uganda. Citizens in developing countries are restrained by the lack of access to various ICTs and as such, it serves as an impediment to improving their QoL [20,42]. Nevertheless, literature has called for future studies to examine the effects of ICTs on QoL at the global level [13]. The lack of generalizability of prior studies largely conducted in single countries to the global level necessitates this call. Hence the hypothesis;

H2. ICT access positively influences the QoL

3.3. Digital inclusion and ICT usage

Extant studies on the effects of digital inclusion on the use of ICTs remain underexplored. In a society where digital inclusion is promoted, the use of ICTs may increase. A digitally enabled society empowers individuals to use ICTs to actively participate in governance. Charoensukmongkol & Moqbel [12]; Krishnan, Teo, & Lim [36] contend that a participatory government empowers citizens to interact with the government and gain access to government information as well. The effect of a participatory government is reduced levels of corruption, especially in Africa [2]. Digital inclusion enables individuals to connect and interact with family and friends from around the world [18,59]. Therefore, for a digitally inclusive society, individuals must not only have access to ICTs, they must use it to improve their QoL. Therefore, the hypothesis;

H3. Digital inclusion positively influences ICT usage

3.4. ICT access and ICT usage

IS researchers contend that ICT use augments ICT access [33]; [39]. This is because if the necessary mechanisms are not put in place to ensure that individuals can use ICTs, merely providing access to ICTs will be in vain. The literature highlights the effect of ICT access on ICT usage [6,30] supporting the essence that, when individuals are provided affordable access to ICTs [33] it will motivate them to endeavor to learn how to use it. Past studies have identified the high cost of ICTs as barriers to the use of ICTs especially in rural areas and developing countries at large [15,33].

Access and use of ICTs bring forth several opportunities and merits to individuals, businesses, and governments. For example, Adam [2] suggests that access and use to ICTs reduce corruption in Africa as governments can easily be held accountable for their unnecessary spending and misallocation of resources through e-government systems. Srivastava & Teo [54,55] further argue that providing access and use of ICTs allows governments to easily interact with citizens thereby promoting transparency and improving social participation. Therefore, the hypothesis;

H4. ICT access positively influences ICT usage

3.5. ICT usage and QoL

The use of ICTs has been found to significantly influence people's QoL [13,37,44,45,50]. For example, findings from the study of Quan-haase et al. [44], show that the use of ICTs in everyday life improves the QoL of its users. Roztocki & Weistroffer [48] similarly contend that the use of ICTs affects everyday lives by enabling the betterment in infrastructure and a higher standard of living. They further suggest that individuals' acceptance of ICTs is key to sustaining and enhancing their QoL. However, the use of ICTs has been derailed by the lack of appropriate digital skills needed in the use of ICTs [10,11]. Therefore, it is imperative that to enhance the use of ICTs, attention should be placed on improving the digital skills of individuals. By doing so, ICT use will be enhanced and this can positively influence the QoL of people. This leads to our last hypothesis;

H5. ICT usage positively influences the QoL

4. Research methodology

4.1. Data sources, variables, and constructs

We relied on archival data for 121 countries from the Network Readiness Index Report for the year 2018 [17]. All the four latent constructs and their assigned indicators which showed how the latent constructs were measured are derived from this report. For instance, the latent variable QoL which denotes the social impact of participating in the network economy was measured by happiness, freedom to make life choices, income inequality, and healthy life expectancy at birth [17]. The constructs and their assigned indicators are shown in Table 1.

We used the common data points in the reports and indicators that had missing data of less than 5% [28] were mean-replaced. The 121 countries in the report were used since no many missing values were deleted. The use of archival data proved as the most suitable way of undertaking this study because it was impossible to personally collect primary data from all 121 countries. In addition, our source of data has been relied on by several studies in the past and the reliability of the metrics has been vouched for by these earlier studies [3,35]. Therefore, using these archival sources proved as a cost-effective way to carry out this study.

We used Partial Least Squares-Structural Equation Modelling (PLS-SEM) to analyze the data. As recommended by Hair, Ringle, & Sarstedt, Hair, Ringle, & Sarstedt, (2011), the minimum sample size required to carry out this study was 70 based on the 10 times rule on the constructs with the maximum number of indicators (i.e., 10*7). Since we had data for 121 countries it meant that the minimum sample size recommended was achieved. An analysis of the measurement and structural models were then carried out.

5. Analysis of results

The data was analyzed using PLS-SEM [26,27] and SmartPLS version 3.2.8 [46]. The results were then used to evaluate the hypotheses. As recommended for reflective models [25,26,57], an evaluation of the measurement model was done followed by the structural model

Table 1
Constructs, their assigned indicators, and the sources of data.

SN	Latent Variable	Indicator	Data Sources
1a		E-Participation	
1b	Digital Inclusion	Socioeconomic gap in use of digital payments	Network Readiness Index Report 2018
1c		Availability of local online content	
1d		Gender gap in Internet use	
1e		Gap in the use of digital payments	
2a	ICT Access	Mobile tariffs	
2b		Handset prices	
2c		Internet access	
2d		4G mobile network coverage	
2e		Fixed-broadband subscriptions	
3a	ICT Usage	Internet users	
3b		Active mobile-broadband subscriptions	
3c		Use of virtual social networks	
3d		Tertiary enrollment	
3e		Adult literacy rate	
4a	QoL	Happiness	
4b		Freedom to make life choices	
4c		Income inequality	
4d		Healthy life expectancy at birth	

evaluation. The measurement model was evaluated for indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. An evaluation of the structural model followed for the significance of the path coefficients and the model's goodness of fit. The required rules of thumb were followed in the interpretation of results.

5.1. Evaluation of measurement model

The evaluation of the reflective measurement model includes an evaluation of the indicator loadings, internal consistency reliability, convergent validity, and discriminant validity [26]. Table 2 shows the results of the reflective measurement model. For the evaluation of indicator loadings, loadings of at least 0.708 are required [26] as they indicate that items sufficiently measure a construct. However, not all loadings met this threshold. The loadings that were below the threshold were deleted and the model was rerun. Specifically, items for digital inclusion (i.e., gender gap in internet use, and the gap in use of digital payments), individual IT usage (i.e., ICT skills), ICT access (i.e., international internet bandwidth, and internet access in schools), QoL (i.e., freedom to make life choices, and income inequality) were deleted. All other items met the required threshold of 0.708 as presented in Fig. 2.

Composite reliability (CR) values were used to evaluate internal consistency reliability. CR values of at least 0.70 are recommended [19] to ensure internal consistency reliability. CR values presented in Table 2 suggest that internal consistency reliability has been achieved. The Average Variance Extracted (AVE) was used to assess convergent validity [19]. AVE values of at least 0.50 are required to achieve convergent validity [26]. As shown in Table 2, all AVE values exceed 0.50.

Discriminant validity was assessed using the cross-loadings [14,19]. Table 3 presents the cross-loading values. Table 3 shows that item loadings load higher for their assigned construct than for any other construct thereby confirming discriminant validity [14]. The Fornell & Larcker, (1981) criterion was the other measure used to assess for discriminant validity. Fornell & Larcker values are shown in Table 4. As shown in Table 4, the constructs share more variance with their assigned constructs than with any other construct. Furthermore, the shared variance of all the constructs in the model does not exceed their AVEs. Therefore, it can be generalized that discriminant validity has been met [26].

5.2. Evaluation of structural model

Tables 5 and 6 show the results for the structural model relationships. Using a 10% two-tailed distribution, four (4) of the five (5) estimations in the structural model direct relationship are significant (see Table 5) and one (1) of the two (2) indirect relationships is significant (see. Table 6) because they scored a t-value of at least 1.65 [24]. For direct relationships, digital inclusion has the strongest relationship with individual IT usage (t = 27.5434), followed by digital inclusion and QoL (t = 6.3529). Digital inclusion and ICT access explain more than 60% of the in individual IT usage (see. Fig. 2, and Table 7). Furthermore, all three constructs (i.e., digital inclusion, ICT access, ad individual IT usage) explain about 75% of the variance in QoL (see. Fig. 2 and Table 7).

Table 2
Reliability and validity.

Construct	Composite reliability	Average variance extracted (AVE)
Individual IT Usage	0.9216	0.7032
Digital Inclusion	0.8961	0.7425
ICT Access	0.9291	0.7245
QoL	0.9348	0.8775

Table 3
Discriminant Validity (Cross-loadings criterion).

Indicator	Individual IT Usage	Digital Inclusion	ICT Access	QoL
Mobile tariffs	0.0730	0.0180	0.8429	0.1228
Handset prices	0.1570	0.1067	0.9043	0.2145
Internet access	0.1560	0.0829	0.9110	0.1833
4G mobile network coverage	0.0421	−0.0249	0.7922	0.1389
Fixed-broadband subscriptions	0.0276	−0.0067	0.7981	0.1090
Internet users	0.9213	0.7888	0.1091	0.8176
Active mobile-broadband subscriptions	0.8230	0.7150	0.0637	0.6385
Use of virtual social networks	0.8848	0.6372	0.1180	0.7603
Tertiary enrollment	0.8441	0.7144	0.2079	0.7228
Adult literacy rate	0.7033	0.4107	−0.0061	0.5062
E-Participation	0.6751	0.8568	0.0759	0.7066
Socioeconomic gap in use of digital payments	0.5772	0.8088	−0.0391	0.6049
Availability of local online content	0.7847	0.9161	0.0987	0.8272
Happiness	0.7211	0.7664	0.2122	0.9312
Healthy life expectancy at birth	0.8370	0.7995	0.1520	0.9422

Table 4
Discriminant Validity [19] criterion).

Construct	Individual IT Usage	Digital Inclusion	ICT Access	QoL
Individual IT Usage	**0.7032**			
Digital Inclusion	0.6341	**0.7425**		
ICT Access	0.0161	0.0036	**0.7245**	
QoL	0.6956	0.6995	0.0372	**0.8775**

Squared correlations; AVE in the diagonal.

6. Discussion of results

This study examines the effects of digital inclusion and ICT access on the QoL of individuals' at the global level on one hand and the mediating role of ICT usage on the link between digital inclusion on QoL and ICT access on QoL on the other. The study relied on structuration theory as the theoretical stance and secondary data from 121 countries worldwide for 2018. Through the analysis of data using SEM-PLS some intriguing findings emerged. First, our find adds to the few studies that examine the effects of digital inclusion on QoL such as thefindings of Afshar et al. [4], that digital inclusion predicts QoL and the vice versa. The analysis of results from our study adds to this literature by examining the association between digital inclusion and QoL and provides a global view of this relationship. Our findings confirm that digital inclusion significantly influences the QoL at a global level. This implies that the presence of a digitalized society allows individuals to connect and communicate with people around the globe with ease. This enhances their happiness and affords them the freedom to make life choices and thereby improving their well-being.

Second, past research highlights the essence of ICTsaccess in improving the quality of individuals' lives [13,34,42]. Whilts the majority of these studies concentrate on single countries, our study provides a global insight into this burgeoning research area. Our findings provide evidence that ICT access significantly influences the QoL of people generally. This suggests that, if individuals are provided with affordable access to ICTs, they can become happy and satisfied and thus experience an improvement in their QoL.

Third, the positive association between digital inclusion and ICT usage was supported. Whilst literature highlights the importance of digital inclusion on QoL, research on the effects of digital inclusion on

Table 5
Direct hypotheses results.

Hypotheses	Effect	Standard beta	Standard error	t-value	Decision	95% CI LL	95% CI UL
H_1	Digital Inclusion - > QoL	0.4827	0.0760	6.3529	Supported	0.2941	0.6657
H_2	ICT Access - > QoL	0.1086	0.0488	2.2230	Supported	−0.0372	0.2220
H_3	Digital Inclusion - > Individual IT Usage	0.7915	0.0287	27.5434	Supported	0.7107	0.8556
H_4	ICT Access - > Individual IT Usage	0.0793	0.0560	1.4180	Not Supported	−0.0790	0.2036
H_5	Individual IT Usage - > QoL	0.4359	0.0741	5.8816	Supported	0.2506	0.6114

Table 6
Indirect effects results.

Effect	Standard error	Standard error	t-value	Decision	95% CI LL	95% CI UL
Digital Inclusion - > QoL	0.3450	0.0565	6.1076	Supported	0.2026	0.4886
ICT Access - > QoL	0.0346	0.0251	1.3781	Not Supported	−0.0355	0.0968

Table 7
R squared.

Construct	Coefficient of determination (R^2)	Adjusted R^2
Individual IT Usage	0.6404	0.6343
QoL	0.7882	0.7828

ICT usage remains limited. Our findings suggest that members of a digitally inclusive society will enhance their use of ICTs. A digitally inclusive society characterized by e-participation will ensure participatory governance via ICTs. A participatory government will ensure that individuals can interact with the government as well as gain access to government information via ICTs. Adam [2] contend that a participatory government will lead to a significant reduction in corruption, especially in Africa. A reduced corruption in government will mean more resources in the hands of governments to provide needed services for the people and thereby increasing their standard of living and QoL.

In addition, despite the literature confirming the positive association between ICT access and ICT use [15,30,33]. Our findings from this study show otherwise. The significant influence of ICT access on ICT use was not supported indicating that, access to ICTs is not a necessary condition for the use of ICTs. We rely on previous studies that have argued that, to ensure the use of ICTs, efforts should be made to improve the digital skills of individuals [3,49] especially in developing countries where the level of digital literacy is low [15,38]. Based on our findings, providing affordable access to ICTs will not be sufficient to increase the use of ICTs. Governments should, therefore, endeavor to improve the digital skills of citizens alongside to completely realise the benefits of citizens access to ICTs.

Finally, ICT usage was found to significantly influence the QoL. Our findings confirm the evidence from previous studies that examined this relationship [37,44,50] though our evidence provides a global perspective. We further examined the moderating effects of ICT usage on the relationship between ICT access and QoL, and digital inclusion and QoL. Whilst prior research is silent on the moderating effect of ICT usage, findings from our study fill this gap by supporting the moderating effects of ICT usage on the relationship between digital inclusion and QoL. This means that through ICT usage digital inclusion significantly influences the QoL at the global level. However, the moderating effects of ICT usage on the relationship between ICT access and digital inclusion were not found to be significant. Notwithstanding this, our findings provide novel insights on the moderating role of ICT usage on the relationship between ICT access and QoL, as well as on digital inclusion and QoL.

6.1. Implications for research and practice

This study offers some key contributions to research. To the best of our knowledge, this is the first study to examine these relationships in a single model and at the global level. In addition, we theoretically show that individuals' QoL can be enhanced through ICT access, ICT use, and digital inclusion. This provides key insights through our use of structuration theory in a novel way to explain how individuals' QoL may be enhanced through the interaction of agency and structure.

The findings from this study have some policy implications. First, our findings show that ICT access and digital inclusion significantly influence the QoL. Therefore, whilst developing QoL policies, policymakers should take into account the provision of affordable ICT access in creating a digitally enabled society. In this regard, targeted investments should be directed towards developing the technology infrastructure of countries to promote ICT access, ICT use, and digital inclusion. Furthermore, access to affordable ICTs (through lower mobile tariffs, lower handset prices, etc.) will enable people in developing countries to enhance their capability, protect against social exclusion and promote their QoL.

7. Conclusion and future research directions

The purpose of this study was to achieve two main objectives. First, to examine the effects of digital inclusion and ICT access on QoL, and second, to examine the mediating role of ICT usage in our model (see. Fig. 1). We, therefore, developed a conceptual model (see. Fig. 1) informed by structuration theory and drawing on secondary data from 121 countries around the globe to help carry out this study. Our model was validated using PLS-SEM and the results revealed that digital inclusion and ICT access significantly influenced the QoL. Furthermore, results showed that ICT usage significantly moderates the linkage between digital inclusion and QoL but not for the linkage between ICT access and QoL. Our findings from this study make a valuable contribution in the area of QoL where studies at the global level remain scanty. However, we recommend future research to consider expanding our model by adding other variables such as IT readiness. Furthermore, it will be interesting to investigate the moderating effects of digital literacy on the model given that prior research points out the key role of digital literacy on enhancing digital inclusion and QoL. Future research may, therefore, consider this and other moderating effects. Future research can also add more countries to the countries used in the study to provide more insights into the linkages between digital inclusion, ICT access, and QoL. A limitation of this study may be that structuration theory offers interpretivist perspectives and has widely been used by interpretivist researchers in diverse areas. In this study, however, we relied on the structuration theory to empirically examine the interplay between agency and structure, and how this enhances the QoL.

Declaration of competing interest

In putting this paper titled **The Effects of Digital Inclusion and ICT**

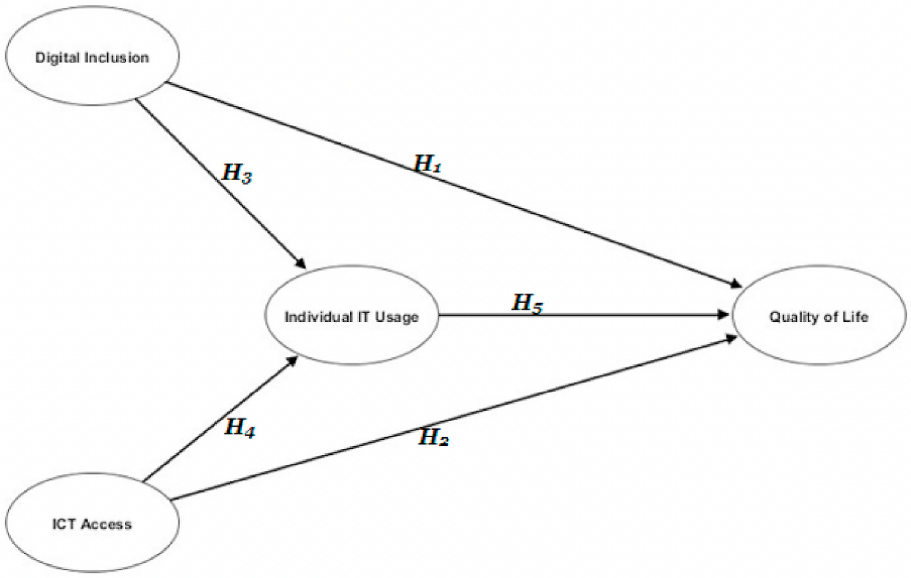

Fig. 1. *Conceptual model.*

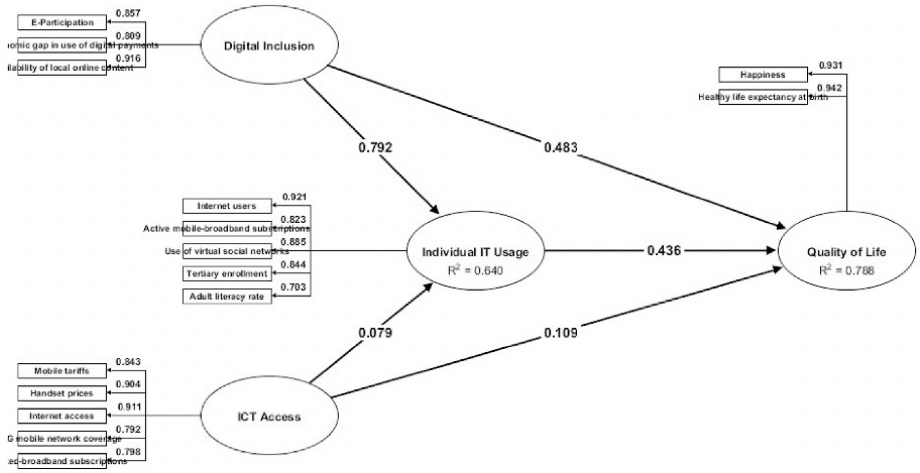

Fig. 2. *Indicator Loadings.*

Access on Quality of Life: A Global Perspective together, the authors declare that there are is no conflict of interest situation and that the author(s) conceptualised the paper, carried out the data collection and analysis. The author(s) also did the writing of the paper.

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