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Is the implementation of the ICT curriculum in low income schools in Africa swimming against or with the tides? The case of selected schools in Zimbabwe

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Abstract The launch of the new Zimbabwean curriculum in 2017 was fraught with challenges in terms of access to digital tools and usage. This case study deep-seated in the qualitative approach examines the nature of digital divide in Zimbabwean secondary schools drawing reference from the implementation of the new 2015–2022 Zimbabwean curriculum in which ICT is embedded. Informed by van Dijk's (The deepening divide: Inequality in the information society, SAGE, 2005) theory on resources and appropriation, the study made use of in-depth interviews and observations to generate data from six purposively sampled School Heads drawn from three rural and three urban schools. Results suggested that, while the introduction of ICT as a learning area had created a pathway for equity in life chances for all learners in the digitalised world, it also continued to entrench and maintain social stratification, thereby perpetuating the happiness of the already privileged. Thematic analysis demonstrates that the Zimbabwean education system while trying to correct the colonial inequalities continues to be plagued with digital divide challenges with regards to equity in context of ICT implementation which created and cemented inequalities in life opportunities. This study recommends that governments; schools and local communities mitigate the life inequalities through the resuscitation of the Schools Computerization Programme (SCP), resource mobilisation and the establishment of free cyber centres in low income schools where the children of the poor learn.

Keywords Access · Digital divide · Equity · Low income schools · Social stratification

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Introduction

In an effort to meet the demands of the digital society, Zimbabwe in 2017 rolled out a curriculum package which included Information and Communication Technology (ICT) as one of the compulsory learning areas (MoPSE, 2015). However, little was done by the Zimbabwean government to ensure equity was met. As such, the introduction of ICT in schools presented a paradox of ICT connectivity in low and high income schools. Against this backdrop, this article explores whether the introduction of ICT was promoting equality of opportunities in education and life chances considering the diverse social context of the students in the current digitalised world, drawing reference from the implementation of the new 2015–2022 Zimbabwean curriculum. To unpack this phenomenon, I briefly situate the research by sketching the background to the study. I then present a review of related literature, followed by an exposition of the theoretical framework on which this study was anchored. The paper in its final segment critically engages the findings with the extant literature, drawing insights from Dijk's (2005) theory on resources and appropriation to interrogate whether the introduction of ICT in Zimbabwean rural schools did cast a shadow of social and cultural reproduction.

Background to the study

The increase in technology use was the impetus for the recent 2015–2022 educational reforms in Zimbabwe. These reforms were mooted in 2015, followed by their launch in 2017 and were expected to be reviewed after 2022. The 2015–2022 curriculum is the term coined to mean educational reforms in Zimbabwe that replaced the old curriculum which was inherited in 1980 from the British government (MoPSE, 2015). Backed by the constitution of Zimbabwe, which celebrated education as a basic human right, the reforms in curriculum were a process of desegregation of the education system from the hangover of colonialism. One assumption created by this reform guided by policy, was that all learners in Zimbabwe were to receive an education system based on equity and equality of opportunities in terms of access regardless of their geographical area of origin or social group. That was true to all learning areas, ICT included. The acronym ICT stands for Information and Communication Technology (ICT) and is a shorthand for the computers, software, networks, satellite links, and related systems that allow people to access, analyze, create, exchange, and use data, information, and knowledge in ways that are almost imaginable (van Dijk, 2005). In the context of this study, the term ICT will general mean all technologies used for processing information and communication.

However, the process of ICT policy appropriation or misappropriation by schools from different territorial settings remained unexplored in the Zimbabwean context. Researchers' excitement and concentration were confined to whether schools were implementing the ICT as a learning area without looking at the digital divide propagated by issues of unequal connectivity (Andiema, 2015; Karunaratne et al., 2018; Mavhemwa et al., 2017; Ramadan & Chen, 2018). The educational reforms

by Zimbabwe set new and more challenging demands on schools which were in conflict with the policy that called for equality of opportunity in the education sector as envisioned in the constitution of Zimbabwe. Very few studies in Zimbabwe if there are any, concentrated on sociological analysis of digital divide; how this is linked to social and cultural reproduction and how to address the inequalities. The purpose of this study is to explore the nature of digital inequalities evident in secondary schools in Zimbabwe, examine how they impacted on future participation of students in society and suggest strategies for bridging the gap. The following research questions guided the study: (1) what are the nature of the digital inequalities in Zimbabwean Secondary schools? (2) How do they impact on the social structure of Zimbabwean societies? (3) How can the digital inequalities be mitigated?

Literature review

While there are emerging studies that attempted to explore the wider concept of digital divide in developing countries such as those across Africa (Arakpogun et al., 2017, 2020), analysis of research reveals that most studies were done in developed countries which then left emerging countries with limited research (Bulman & Fairlie, 2016; Falck et al., 2018; Patterson & Patterson, 2017; Weber & Becker, 2019). As such, studies on the digital divide in the developing countries in general and African nations in particular remained very few and without a comprehensive interrogation of the concept. This study unpacks this unchartered area drawing reference from Zimbabwe since it had recently introduced an updated curriculum in which ICT is a compulsory learning area from Early Childhood Development to tertiary institutions. However, no effort was put in place by the government of Zimbabwe to ensure equality of access to both ICT tools and accessories by students considering that Zimbabwean schools are located either in the urban or rural contexts which denote both their geography and economic statuses (MoPSE, 2015). The ecological settings from where students hailed, characterise to some extent their level of digital divide, a term which this paper conceptualised to mean the disparity between households that have access to the internet and households that do not have access to the internet (Pierce, 2019; van Deursen & Mossberger, 2018; van Dijk, 2017) and other ICT tools. Physical access is the first level of inequalities as explicitly explained by Van Dijk (2017, p. 2) that it entails "obtaining the hardware, software and connection to the internet." Therefore, the first level of the digital divide embraces physical and material access. In and of itself, it includes the distribution of internet connection and penetration of computers and the accessories into the community.

Literature acknowledges that while technology is moving at a lightning speed, some people afford the latest hardware, software, and mobile applications, while others lag behind especially the poor, the undereducated and racial–ethnic minorities (Pierce, 2019). That point, is further elaborated by Maceviciute and Wilson (2018, p. 270) who note that digital inequalities manifest themselves "internationally among countries with different economic development and, within countries, among different social groups." This suggests that: within a country the national economy dictates the people' general standards of living. As such, social groups and individuals

within the same country but in different geographical areas possess different economic, social and cultural capital. This is also seen in Zimbabwean schools where students and teachers from the urban areas are better placed than those from the rural settings in terms of accessing internet and other ICT accessories (Mavhemwa et al., 2017). Considering this disparity, this study was interested in understanding the nature of the digital divide which existed in secondary schools located in urban and rural contexts and the relation of the inequalities to the continuation of social stratification. Empirical research on social stratification in the digital era shows that digital inequalities are reproduced not only by class dynamics (economic aspects) but also by status and prestige (cultural aspects) and group affiliations (socio-political aspects) (Ragnedda & Muschert, 2015). Despite the above observation, Mavhemwa et al. (2017) applauds the initiatives in ICT development because of the importance attached to its adoption as a learning area hereunder presented.

Evidence from literature indicates that the underlying motivation behind the introduction of ICT as a learning area in any country hinges on the correlation between ICT and the economic growth and its strength in abating poverty (Gillwald, 2017; Maceviciute & Wilson, 2018; Weber & Becker, 2019). That is because in the digital era ICT has an integral role in individuals' lives and is considered indispensable for full social engagement in one's society since it improves the life chances and opens possibilities for individuals and groups to participate in the life of the society and community. Earlier on, Hawkridge (1990) proposes six rationales for using ICT in education that influence ICT policies with regard to ICT integration of which these include: social rationale which connotes the need to teach with basic ICT skills in order to prepare students for their place in society; vocational rationale which is concerned with the importance of ICTs in giving students appropriate skills for future jobs; the pedagogical rationale which refers to the enhancement of teaching and learning with the help of ICTs; the catalytic rationale which implies the role ICTs may have in realizing educational change; the information technology industry rationale which aims at the promotion of the ICT industry in education; and the cost effective rationale evolving around the expectations that ICTs will reduce costs for education. These rationales for ICTs in education provide policymakers and other stakeholders with arguments for the utilisation of ICTs in education.

Scholarship is abound which examines ICT usage in schools and reports that students use ICT in computer studies followed by the natural sciences and human sciences (Bulman & Fairlie, 2016; Falck et al., 2018; Patterson & Patterson, 2017; Weber & Becker, 2019). That observation is consistent with the education system in Zimbabwe, where ICT was introduced as part of the 2015–2022 new curriculum (MoPSE, 2015) but the nature of digital inequalities had not been given due attention it deserves in ameliorating digital exclusion precipitated by social class as reflected in the citizenry.

Globally, efforts had been made in several countries to craft intervention strategies to bridge the digital divide, albeit challenges remained unresolved, for instance Pierce (2019, p. 5) reports that one such project was to "provide hardware and connectivity in underdeveloped countries through a low-cost laptop program called One Laptop per Child." These laptops were parcelled out to children in Afghanistan, Kenya, Nicaragua, Peru, Rwanda, and Uruguay and in

a few marginalized urban areas in the United States to abate the digital disparities. Such strategies by donor agencies were an attempt to pronounce equity and equalities to ICT access but Gillwald (2017, p. 3) warns that interventions by institutions that are not as nimble as these complex adaptive systems can undermine innovation and this presents a major challenge for marginalized people in developing countries which generally lack the institutional endowments to regulate effectively in the public interest. The state of ICT infrastructure and facilities in institutions of learning, especially in most third world countries where governments have struggled to subsidise education is dire (Bray, 1999). Literature reveals that in excess of 82% of African students do not have access to internet in Sub-Saharan Africa, thus, frustrating the realisation of inclusive and equitable quality education (Nakweya, 2021). While early integration of ICT into primary and secondary curricula through formal recommendations is an important lever to digital literacy, the integration of ICT for example in sub-Saharan Africa, is a low priority when compared to other objectives and statistics show that several countries in Africa have no an active policy or plan to implement ICT into the education system (UNESCO, 2015). By 2007, all but a handful of countries in Africa surveyed already have a national ICT policy in place or under development. While some of these national policies define goals and implementation strategies for ICT in the education sector, nearly half the countries have chosen to develop an ICT policy that is specific to the education sector (Farrel & Isaacs, 2007). However, South Africa is currently one of the countries in southern Africa where ICT has made a significant impact to the society. The e-education vision is to provide ICT platforms for learning where learners and teachers increase their computer literacy and skills for full participation in a knowledge society (Barakabitze, et al., 2019). While most countries have embraced policy development, there is a notable stratification in terms of their ability to implement. The development of plans doesn't necessarily equate with implementation and results on the ground. In most cases implementation remains very dependent on the support of partners from the donor community and the private sector. A country like South Africa, with its extant infrastructure and more mature economy, is clearly an outlier in terms of being able to implement its ICT in education agenda (Farrel & Isaacs, 2007).

Experts in telecommunications and sociology of information society made some proposals on how to close the digital divide in the world. A comprehensive package was advanced by van Dijk (2020) as shown on Fig. 1 on the next page. The general conclusion drawn by van Dijk (2012, p. 14) in addition to the wheel of policy instruments to close the digital divide was the use of five strategies namely to: "maintain or revitalize social mobility, increase the number of long-term social programmes adapted to disadvantaged group in their own communities, provide cheaper digital technology, design technology that is easier to use and draw up rules and regulations to manage the beneficial use of digital media." Research also detects that physical access is still the first priority in the developing countries though in a global policy perspective we are shifting to problems of skills and usage (World Bank, 2016). Closing the digital divide can never be totally achieved. This could be better explained by van Dijk (2012, p. 5) who argues that:

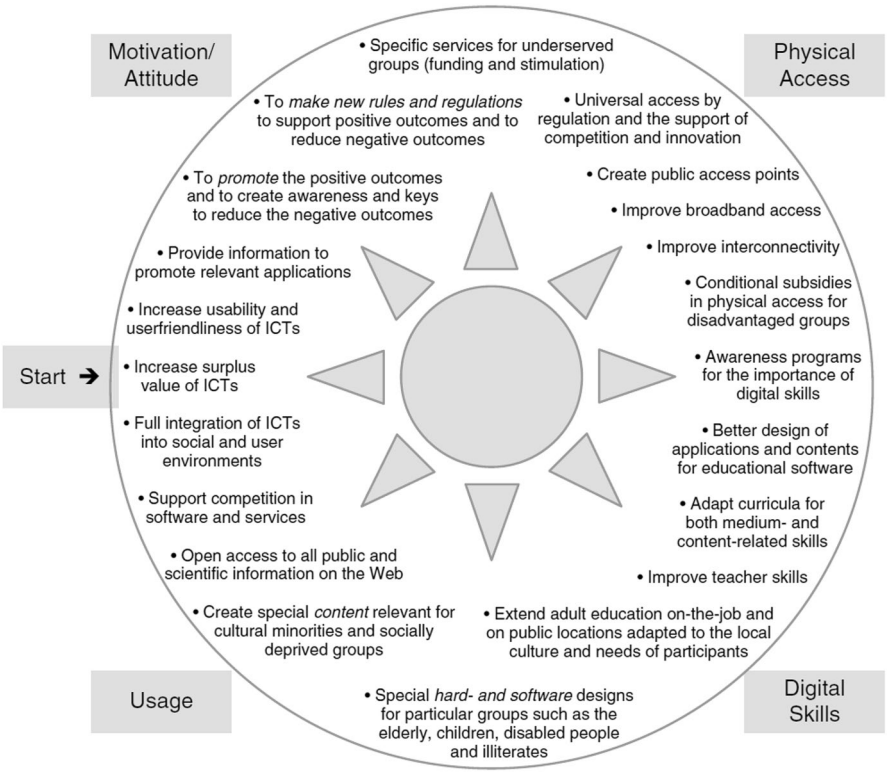

Fig. 1 Wheels of policy instruments to bridge the digital divide. Source: van Dijk (2020, p. 149)

> Physical access is growing and we can expect that in two decades about 75–80% of the world population will have Internet access. However, technology changes. With new types of digital media the history of physical access will be repeated: the Internet of Things, Augmented and Virtual Reality and others are first adopted by young people with high education and income. Some will possess all digital media and others only one type.

Give such an observation, this study reminds us that the digital divide among schools in developed and developing countries is far from being closed. The study is significant in that it inherently provides novel insights that the experience of adopting ICT curriculum had been very different, and unequal across the secondary schools in Zimbabwe in particular.

In the context of Zimbabwe, the issue of access to internet and connectivity trekked a rough terrain. As put by Jenjekwa (2013) that while the Government of Zimbabwe had made pronouncements on equality of educational opportunities for all children, it remains wistful since education provision is highly divisive and detrimental to national cohesion. However, to buttress the inclusion discourse in a digital age, Zimbabwe put in place what was termed the School Computerisation Programme led by the Former President of that country, who donated computers

to several schools which were connected to the national electricity grid (MoPSE, 2015). That perpetuated exclusion which was in conflict with the beliefs of equality of opportunities because rural secondary schools which were not electrified were left behind. However, the programme collapsed before it could take off due to lack of ICT infrastructures and qualified teachers at the institutional level.

There was however a dearth of literature in the Zimbabwean context which explored the nature of the digital divide in Zimbabwean schools from the time ICT became part of the updated 2015–2022 Zimbabwean curriculum (MoPSE, 2015). Until now, digital research in Africa in general and Zimbabwe in particular has immensely focused on the teachers' experiences in implementing ICT in schools (Andiema, 2015; Karunaratne et al., 2018; Ramadan & Chen, 2018) but neglected to examine the School Heads' views on the ramifications in social structures brought by the nature of physical access as determined by demographic experiences and exposure. There was a scholarly silence on the consequences of having more or less access to ICT and the perceived benefits of (un)equal access in the digital society which this study sought to address.

Theoretical framework

I drew from van Dijk's (2005) theory on resources and appropriation as a theoretical framework for this study. In this theory, van Dijk (2005) presents a version of structuration theory (resources) and acceptance theory (appropriation) in which several assumptions related to digital divide are made. Van Dijk's (2005) presents a theory on digital divide which hinges on access of ICT related to various dimensions which include material, motivational, skills, and actual usage access. The four levels of access are the core of van Dijk (2005)'s theory. Lack of elementary digital experience caused by lack of interest, computer anxiety and unattractiveness of the new technology is what van Dijk (2017) conceptualises as motivational access whereas no possession of computers and network connections is material access or physical access. Interestingly, Van Dijk (2005) used the term 'deepening divide' to emphasize that the problem of digital inequality does not end after physical access has been attained but actually starts when the use of digital media is incorporated into daily life. Skills access sometimes called digital literacy refers not only to the skill to operate computers and network connections, but also as the skill to search, select, process and apply information from a superabundance of sources and the ability to strategically use this information to improve one's position in society (van Dijk, 2017). Lack of such skills can be caused by insufficient user-friendliness and inadequate education or social support. Lastly, the usage access is measured as usage time and frequency; number and diversity of usage applications; with networks, broadband or narrowband use; and more or less active or creative use.

One tenet that articulates the physical access explains that categorical inequalities in society produce an unequal distribution of resources. In the context of this study, rural and urban communities and their schools within a country represent some form of categorisation on which unequal resources distribution is based. This state of unequal distribution of resources evident in the urban and rural schools is a drive

to unequal physical access to digital technologies. Meaning urban schools enjoy the physical access while the rural schools get limited access. The ramifications of the unequal access to digital technologies are a fertile ground which brings about unequal participation and life opportunities in society. When there is an unequal participation in society based on where one was educated (either rural or urban), this reinforces social inequalities and unequal possession of resources later in life. van Dijk (2005) combines a resource-based approach and a network approach, which together focus on social positions, resources, and relations in the labour market and households.

Methodology

Using van Dijk's (2005) theory on resource and appropriation, this case study engrained in the qualitative approach gleaned insights from six School Heads drawn from secondary schools located in urban and rural centres in Zimbabwe. The selection of these School Heads was premised on the idea that the types of schools they led that were under study mirrored the type of schools found in developing countries. The study drawn from interpretivism, was aimed at understanding the views of the School Heads from the selected six schools in their natural settings or context as De Vos et al. (2014) claim. Their views and representations could not be subjected to numerical analysis hence the appropriateness of the qualitative approach in the current study. The study was set to find meaning in narratives (Creswell & Poth, 2017); hence it searched for an understanding of nature of the digital divide and its impact in Zimbabwean secondary schools and the intervention strategies for averting it. The research design was cast as a descriptive and interpretive case study which fitted well within the interpretive methods (Ledford & Gast, 2018). I borrowed from Yin (2015) who sees the primary defining features of a case study as being multiplicity of perspectives which are rooted in a specific context and also from Cohen et al., (2011, p. 289) who view it as a "unique example of real people in real situations." The study sought to get different views from the purposively sampled School Heads drawn from urban and rural microcosm representations of schools in Zimbabwe allowing binary voices. I selected the.

One on one in-depth interviews and observations were used to capture the School Heads' representations of the nature of digital divide evident between urban and rural schools and how that affected the social structure of Zimbabwe communities. I made use of the in-depth interviews so as to encompass questions aligned to the focus of the project; to enable me to make cross-analysis of results (Cropley, 2015; Yin, 2015); and to open opportunities to probe further for new and relevant issues that could develop during the interviews. The interviews were tape recorded with the granted permission from the participants and I jotted down notes during each interview as a back-up. I recorded the personal interviews following the order in which they were undertaken instantaneously on what had emerged. During the transcribing process I kept on highlighting with different colours some of the notes answering the study questions. When nearing the end of the study, the School Heads were then given transcripts of the notes to read, correct, comment and approve or disapprove.

Later the edited transcripts from the interview were corrected and retyped. As for observations, I wrote down short notes on the same day of the interviews whilst my memory was still fresh. I elected observation as a technique of collecting data because it enabled me to obtain first-hand information of the context of the natural settings in which ICT was implemented in Zimbabwean secondary schools. Bricki and Green (2016, p. 20) take that further and argue that it aids the investigator "to understand fully the complexities of many situations," I chose six School Heads basing on their experiences in teaching and supervising students in the urban and rural contexts, thus picking them on their potential to provide useful and relevant information on the nature of the digital divide. I shared De Vos et al., (2014, p. 222) that sampling relied on "very few numbers which could provide an inkling of what was to emerge in the entire population." So the School Heads I chose in the current study were selected to give a valid representation of other School Heads in similar settings since three were from rural schools while the other three were from urban schools.

The research sites and participants

The study was conducted at three urban and three rural secondary schools. The rural schools were located in the remote areas of the country where internet infrastructure and connectivity were challenges. The urban secondary schools were located in the affluent suburbs where internet issues were not a challenge at all. Below is a table showing the pseudonyms of School Heads, their gender and age; the geographical location and social class of the schools they managed (Table 1):

The six mixed gender Heads of School from the three participating schools were selected based on the geography of their schools. Their selection was premised on whether their schools were deeply rooted in town or rural which was done to assist in discerning the nature of the digital divide using the two extreme ends. In addition, the Heads of schools were selected because they were information-rich since they were individuals with more than 5 years of experience at those schools and thus were proficient and well informed with a phenomenon under study. Besides, their availability and willingness to participate, and the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner made them the best participants. Choice of the schools was based on what provisions the school had. Table 2 below shows the information on schools and their resources.

Table 1 Pseudonyms used for school heads

Name of head	Gender	Age	Geographical location	Social class of the school
RH1	M	43	Rural	Low income
RH2	M	47	Rural	Low income
RH3	F	44	Rural	Low income
UH1	F	46	Urban	High income
UH2	F	45	Urban	High income
UH 3	F	42	Urban	High income

Table 2 Information on the schools

School	Equipment available	Number of students	Computer teachers available	Number of computer lessons per week
Rural 1	5 Desktops computers	815	1	4
Rural 2	1 Desktop, 3 laptops, 3 tablets	525	1	4
Rural 3	5 Laptops, 2 tablets	412	1	4
Urban 1	25 Desktops, 5 laptops, 5tablets	400	2	4
Urban 2	50 Desktops, 5 laptops, 15 tablets	500	3	4
Urban 3	30 Desktops, 10 tablets, 10 laptops	420	3	4

Data analysis and ethical considerations

In the current research, data analysis was done by reducing the size of data, through sieving the most relevant data and, identifying common and noteworthy patterns. I then used these patterns as themes. Aware of Maree's (2012) and Patton's (2015) advice, data analysis was done concurrently with data collection to curb accumulation of large volumes of data. In my case study, data were thematically presented as narratives. Trustworthiness of the study was enhanced through member checking, where themes were sent back to the School Heads who made verifications whether the "data matched or not to their lived experiences" (Birt et al., 2016, p. 1802). To uphold ethical issues, permission was first sought from and granted by the Permanent Secretary of the Ministry of Primary and Secondary Education, Provincial Education Director for Masvingo Province and the District Schools Inspector of the six schools to conduct research in their schools. The School Heads provided written informed consent for their participation and for the use of the solicited data while I guaranteed confidentiality and full sharing of the research findings with them. Consent was also sought for the use of their verbatim responses in form of quotes for publication. To hide their identity, I used pseudonyms so as to ensure the results were in no way going to be linked to them.

Findings

This segment discusses the nature of digital inequalities, their effects on social structures of the society and the strategies for intervention. The discussion below stems from empirical data that was analysed using van Dijk's (2005) theory as a theoretical lens.

The nature of the digital inequalities

From the observations of the six schools and the personal in-depth interviews with the School Heads, it emerged that the nature of the digital divide reflects that the

poor-rich dichotomy was still rife in urban and rural secondary schools despite that Zimbabwe took a bold stride in introducing ICT as a compulsory learning area in the 2015–2022 curriculum. As aptly narrated by Rural Head 1 (RH1) that:

> The introduction of Computer Science in the curriculum as a compulsory subject from Early Childhood Development to Tertiary institutions is a noble idea but fraught with trenchant challenges that emanate from the socio-economic differences that exists between the urban and the rural schools. The urban schools are often rich and already at an advantage because they possess economic power to set up ICT infrastructure and purchase both hardware and software to enable their students to do well in examinations at the end of the course.

That sentiment was backed by the Urban Head 2 (UH2) who narrated thus:

> We are better off than our counterparts who are in the rural schools who theorise most of the ICT concepts because they have little purchasing power to establish ICT labs as well as securing the computers and other accessories. While we encounter challenges because of the 18 hours' electricity outage that beset Zimbabwe as a whole, we are better placed in that we have alternative sources of power that the parents have bought because of their financial position which permits them. At least we have some basic infrastructures that put us at an advantage as compared to our friends in the rural schools.

This suggests that geographical location of the schools determined the nature of resources the schools had and that categorization had an impact on how schools could erect the ICT facilities and source the ICT equipment and tools. In light of that view, urban schools were on the top of the social echelon unlike the rural schools which occupied the low rungs as advanced by van Dijk (2005, p. 3) who argues that "categorical inequalities in society because of the geographical position produce an unequal distribution of resources which in turn brings out unequal access to digital technologies." From the sentiments posed, such disparities force students from low income schools to learn ICT concepts without concrete media while those from high income schools made use of real objects in their learning. That confirms Andiema's (2015) view that socio-economic context of learners and teachers may also affect ICT adoption in disadvantaged schools. He takes that further and argues that in affluent settings, many learners and teachers also have access to computers at home; and are more confident regarding use of computers in school settings and later in life.

It was also evident from the personal interviews that while the implementation in urban schools was better off in urban areas, the schools were also affected by power outage which beset Zimbabwe as a nation. That again meant that the implementation of ICT in Zimbabwe was further affected by the availability of electricity which depended on the socio-economic configuration of the country. Consequently, Zimbabwean students from the rural secondary schools were disadvantaged in the implementation and use of ICT unlike the students in urban secondary schools, despite that Karunaratne et al. (2018) had observed that the ICT

policy of Zimbabwe was aimed to provide connectivity in all schools to promote universal computer literacy. Suggesting that, failure to implement national policy led to challenges and the emergency of new social class which were related to educational development in Zimbabwe (Bennel, 2021). Yet policies crafted were meant to better the learners' physical access to ICT so that the students become competitive in the global village as hinted in several researches (Maceviciute & Wilson, 2018; Van Dijk, 2017; Weber & Becker, 2019) which further suggest the use of political will to promote equality of access to all students.

From the observations and the one on one in-depth interview it came out that urban learners enjoyed physical access to ICT. In the words of Urban Head1 (UH1):

> Each of our students has access to the computer lab, the computers and the internet for at least two times a week at this school. Every student is given a chance to operate the computers because we have enough computers for an average class of forty students. This exposure is critical because when they sit for the final examinations, they find it easy to tackle the computer practical.

From that narration, it was evident that learners from high income schools were better placed than learners from poor schools in terms of unlocking educational mysteries because of their advantage of having a sound access to ICT infrastructure, computers and their accessories. That confirms what van Dijk's (2005, p. 3) advances in the theory that "unequal access to digital technologies brings about unequal participation in society." Consequently, that eventually reinforces categorical inequalities and unequal distributions of resources in the communities which will in turn determine one's position in the social strata. I argue that physical access to ICT is favourable and advantageous for the scholars in schools located in affluent areas in the sense that they will employ the skills acquired from their exposure and participate in the digital society more effectively unlike the students from the poor schools who in most cases lack that same access and later struggle to operate a computer, let alone to make use of ICT skills. That claim resonates with Deursen and Helsper's (2017) view that economic, cultural, social, and personal types of engagement with the internet results in a variety of economic, cultural, social, and personal outcomes.

While UH1 was happy with what the urban secondary school possessed, RH2 bemoaned of the inadequacy the school experienced. He thus says:

> We are not connected to the national electricity grid. We rely on a small generator to power our electricity appliances. We do not have a computer lab, enough computers, hardware and software at the school not to mention of internet connectivity. Few students who are lucky to have smart phones rely on them to access information though they are limited by poverty which does not allow them to buy data bundles to access the internet.

That finding confirms Kanyongo (2005) who reports that although computers have been part of the country's education curriculum for a long time, their

use has been limited to well- funded urban schools, private schools and boarding schools that have electricity. This view, tallies to the most recent report by Carlson and Goss (2016) which shows that the gap between rural and urban areas in internet use has remained at a fairly constant 6–9 percentage point gap. In addition ZIMSTAT (2013) reports that about 83% of rural schools in Zimbabwe have poor or no infrastructure for the computers which they need for ICT learning. In the same line of thinking, Mavhemwa et al. (2017) report that there are very large differences in the allocation of educational internet resources among the schools in different regions of Zimbabwe. Computer resources are insufficient to meet the needs of especially economically disadvantaged students in the community. This suggests that discrete learners in poor areas suffer significant and possibility indefinite lags in ICT adoption through circumstances beyond their immediate control. Inherently implied in the narration was the use of smart phones as a strategy to bridge the inequality gap among the students.

Effects of the digital inequalities on the social structure

It came out from the personal interviews that such digital divide that exist between the low income schools and rich schools had implications on their life chances. As pointed out by Urban Head 3(UH3) that:

> What we see in schools is a new version of educational stratification existing among learners despite what is enshrined in the Zimbabwean Education Act which calls for education for all. The introduction of ICT in the curriculum entrenches inequalities which will in turn lead to social stratification since the life chances of those with digital skills are enhanced because their conversance with computers skills place them in upper income, power and social status. This is so because possession of computer skills acquired during the education process will determine their future occupations which will decide their level of socio-economic status. Living in town is an indication of a better position in the social strata and these learners further reinforce their position by attending rich schools with ICT infrastructures and ICT tools thereby obtaining the best possible access in terms of the availability of quality teachers and ICT knowledge. In the end, they will do well at school and later occupy better posts in the labour market. This then is the entrenchment of the elite's position in the social strata as this maintains the existing class structure.

This finding suggests that, while Zimbabwe through her legislative strategies had made strides towards equality of educational experiences for all learners by directing the implementation of ICT in schools where learners were taught the same curriculum and assessed the same way, very little was done to provide the ICT resources. In addition, the finding suggests that in the digital society, ICT plays a vital role in the individuals' lives because it is considered as essential for social participation in society in terms of occupation, level of income and above all social status. Thus, this study provides evidence not only of the persistence of a digital divide between rural and urban secondary schools in Zimbabwe, but also of more complicated issues of

relational inequalities in societies which literature also backs of which (Maceviciute & Wilson, 2018, p. 275) argue that "these relational inequality groups remain the same within a country." It illustrates the stubborn nature of rural digital exclusion because in low income schools telecommunications infrastructure is inferior to those serving high income schools. The digital exclusion results in a large numbers of people being unable to fully exploit the potential of ICTs because of what they possess and where they live and learn. The concept of relational inequality (categorical differences between groups of people) is linked to van Dijk's (2005) theory in which it shows how dominant groups appropriate resources and societal norms and how this affects the unequal diffusion and adoption of ICT, which in turn increases categorical inequalities later in their future roles.

Mitigation strategies

The pith of the study was to suggest some strategies which could be employed to avert the effects of the digital inequalities between the low and high income schools based on their geographical positions and their economic statuses. On being asked how the digital divide can be mitigated, Urban Head 3(UH3) suggested a re-look and an amendment of ICT initiatives of which she said:

> We applauded the government for donating computers to some lucky schools at one point in time. That gesture could have been extended to all poor secondary schools so that learners from these areas have hands on approach on ICT learning. Our country is rich with minerals such as diamonds, platinum and lithium which could be used to connect electricity and internet to all schools. At first, they can establish community cyber centres, where students can access computers and internet for free. This is possible because during plebiscite times the same schools are provided with temporary ICT infrastructures for communication by the government. Indicating that, it is not a mammoth task to set up cyber centres for all learners.

The above sentiment confirms an increasingly body of empirical knowledge which is available about how some developing countries had tackled the problem of digital divide. One means by which other nations anticipate bridging the gap in the digital divide is the use of mobile devices (Pierce, 2019). In view of the foregoing perspective, government policy intervention and initiatives in the form of establishing free community cyber centres can be seen as a niche for innovation and progress of a country in totality. A discussion of inclusion presupposes that "marginalized groups will benefit from the same hardware, software, and on- line uses as mainstream groups" (Pierce, 2019, p. 4) if such an initiative is brought on board.

While UH1 suggested the establishment of the free community cyber centres, Rural Head 3 (RH3) proffered another noble idea of which she reveals thus:

> At one point, the former President of Zimbabwe made computer donations to schools in what was became known as the Schools Computerisation Programme (SCP). That was the right step in the right direction. For unknown reasons, that programme died a natural death. If that could be resuscitated,

> the digital divide that we see in our schools could have been partially bridged by now. Government has to re-look into this promising initiative and revive it once again instead of locking these computers in strong rooms because of lack of electrical power to operate them.

This finding shows that the success of the implementation of the school computerisation initiatives were only on paper as the computers remained unused and locked in schools' storerooms. Suggesting a return to what was once mooted which looked promising but faced a natural death in order to mitigate digital inequalities in schools.

It was also a finding of this study that the digital divide is never going to be closed. RH2 remarked that, 'digital divide can never be fully closed. ….since the launch of the ICT curriculum in schools, we still have gaps because some secondary schools possess some digital media and others only one type.' This lends support to van Dijk (2012) who claims that the digital divide can 'never' be fully closed because as social inequality is increasing in many parts of the world, digital inequality will follow. The simple reason is that digital media are important tools that tend to support people with high positions more than those with low positions. This suggests that digital divide can only be lessened. To do so, UH2 said, 'to minimize the digital divide in schools, there is need to improve internet connectivity and broad band access.' This finding resonates with van Dijk (2005)'s theory and the Wheel of Policy Instruments to Bridge the Digital Divide (van Dijk, 2012) which argues that physical access is possible through the improvement of broadband access and connectivity among other issues. The improvement of internet connectivity can definitely not be confined to schools alone because their economic power is weak. What then can be done to improve these areas is to turn to the corporate world for assistance. A remarkable strategy that was suggested by RH3 though it sounds weird given the level of development in Zimbabwe was to design and use cheap technology devices. As noted by UH2 who said, 'most of the ICT tools we use are expensive, the alternative is to locally develop and use cheap tools.' This sentiment carries a plausible strategy, but its usefulness is confined to developed countries which have the capacity to design cheap devices and offer them to students at low costs.

Discussion

ICT reforms in an emerging country such as Zimbabwe face problems that are uniquely different from developed nations because of the variation in the political and socio-economic configuration. As such, educational interventions, practices and policies have to be contextualised in order to speak to the dictates of the country's status. This study acknowledges that students within a particular nation can have different opportunities which they can employ to access ICT tools and internet connectivity which are anchored on the socio-economic constellation of the communities they belong. It further argues that the digital divide between learners may depend on the country's own situation on the international scale of inequality though social stratification remains the same.

While the constitutional measures and the Zimbabwean 2015–2022 educational reforms set the stage for desegregation and equality in all schools to unfold by directing the implementation of ICT, limited effort was made to level the playing field in terms of physical access to enhance ICT implementation; not only in the personal capacities of learners but also in the institutional arrangements and policies of Zimbabwean schools. Thus the roll out of ICT as a learning area in the studied Zimbabwean schools showed from this particular study that there was an entrenchment and extension of social inequalities between the poor and affluent schools. This tallies with Pierce (2019, p. 7) that the digital divide remains an "important and powerful concept", which continues to shape and reshape the level and types of disparities among particular populations. The digital disparities do not start and end at institutional level but manifest themselves in the future lives of learners. This is so because once one is denied access to ICT infrastructure and accessories due to geographical locations and other demographic factors, there are high chances of poor participation in societal activities that demand competence in ICT which include but not limited to job selection, communication skills, marketing skills, level of income and above all standard of living.

Within the context of the neo-Marxists, the implementation of ICT in Zimbabwean schools is a contested terrain because ICT education in its present state is seen as a preservation of the elite's position because it maintains the existing class structure. This is because it continues to favour the interests of the ruling class without considering the working class. ICT education in low and high income schools as evidenced in this research, not only promotes the interests of the elite which justifies and legitimates the capitalist system; but also produces the attitudes and behaviour required by the captains of industries in society. This has had a woeful impact on the already marginalized schools further evidencing that secondary schools are not equal in their ability to provide for, and protect, their students from future exclusion because of institutional inequities. For pupils in these low income schools, learning ICT as a discipline is swimming against the tide because many odds are against them.

The findings in this study shows that the issues related to physical access to internet and broadband confirm van Dijk (2005) theory but ensuring access by all secondary school students in a country is an uphill task. The study in agreement with van Dijk (2021) argues that worldwide people with low income, education and social class hope to catch-up with using a mobile or smartphone. This type of device is the hope for the students in developing countries at least getting access via one medium. If this happens then they would have 'leapfrogged' the technological phases of evolution which is impossible (van Dijk, 2012). If all phases of evolution of technology are to be experienced, this study argues then that governments of developing countries must draw insights from the wheels of policy instruments to bridge the digital divide as advanced (van Dijk, 2020). One area this study commends is the improvement of universal access by regulations and the support of competition and innovation.

Recommendations

Based on the findings and discussion above, this study suggests that governments of developing countries ought to have the political will to establish ICT infrastructures and free cyber centres where the marginalised communities access free training and access to the internet in order to bridge the digital divide between the urbanites and rural populace. Furthermore, the developing countries could also bridge the gap by introducing schools computerization programme where no child is left behind by providing cheap but functional smart phones, laptops, tablets or donating computers to students who find it difficult to possess one due to abject poverty. Since the Internet can be accessed via fixed, mobile, public and private connections, from multiple locations and by using different types of Internet enabled devices such as Wi-Fi connections, 3G and 4G mobile Internet networks, the government can make use of these options to facilitate Internet connectivity to abate poor-rich divide and improve collateral benefits. The study further implores rural schools to come up with strategies on how to acquire computers and ICT tools to shake off the constraints of digital inequalities which promote social class reproduction and competition for life chances. The mobilisation of resources and funds can be extended to the communities where the schools are located. The rural secondary schools may partner the internet service providers in sourcing low-cost computers and erecting ICT infrastructure if students' access to educational opportunities is to be improved.

Setting up digital structures is expensive not necessarily because of materials that are used but very few companies in some developing countries operate in this business of providing internet services. If many players are given the mandate to challenge this kind of monopoly, then a competition to provide services will see the reduction of data costs, the prices of ICT tools as well as the building of digital infrastructures. As such, this study recommends that governments and communities in which universities are located have responsibility of creating liberal internet markets and funding the schools, respectively, for the betterment of all students and therefore should not wait for funding quotas from donors, parents and the communities.

Conclusion

In this paper, it was revealed that schools in different geographical settings with different economic power enjoy different physical access to ICT, its usage and life benefits, thus continuing in the shadows of social stratification despite the ever present constitutional arrangements that preaches equity and equality of opportunities in accessing educational opportunities. The principal argument in this paper is that citizens within a country have to enjoy the same educational access to ICT so that the students benefit the same and equally participate in society based on meritocracy if social divide can be bridged. Thus, I can conclude that, in

planning a digital intervention with the aim of reducing digital inequalities, one needs to assess carefully the context and the needs of participants. To that end, developing countries have to erect free cyber centres where citizens receive free training, computers and access to the internet. Only under such circumstances are learners from all corners of developing countries more likely to benefit from the teaching of ICT as a subject. The value of this study lies in that it contributes to the literature on digital inequalities in schools based on the socio-economic status and geographical location and, more importantly and broadly, to the literature on the how that categorisation reproduces social inequalities which create differential participation in society. In addition, it further demonstrates that concentrating studies on the second level of digital divide and overlooking the first level digital divide inequalities in developing countries is far sighted since second level inequalities can only be understood when equity and inclusion in digital society is first addressed at the first level. The study is significant in that it inherently provides novel insights that the experience of implementing the ICT curriculum have been very different, and unequal across the Zimbabwean secondary schools. This has had a distressing impression on the already marginalized students, further demonstrating that schools are not equal in their capacity to provide for, and protect, their students from future exclusion because of institutional inequities which must be addressed through collective effort. However, the sample for the study-https://snjrnlpms.sps.co.in//index.php# was too small to generalize the findings and thus the study has some limitations. Despite this, the study believes the work could be a starting point for further research. Future studies on the current topic are therefore suggested in order to validate and or extend the current findings.

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