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Techno-optimism and misalignment: Investigating national policy discourses on the impact of ICT in educational settings in Sub-Saharan Africa

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Abstract

ICT in educational settings is increasingly seen as a potential catalyst for improving educational outcomes. In Sub-Saharan Africa, most governments provide a framework for ICT integration through national policies statements. This paper uses a Foucauldian discourse analysis to identify key discursive formations on the impact of ICTs in educational settings that emerge from these statements. We then compare these claims to the available evidence, finding that the formations are underpinned by unempirical techno-optimism. This is attributed to the incentives and influence of private sector actors in the policy formulation process, in conjunction with potential 'easy wins' for governments.

Table of Contents

1. Introduction

Education is critically important in a development context, both instrumentally and intrinsically. The instrumental benefits are widely understood and well-documented in the empirical evidence. Increased levels of education are associated with higher wages (Macdonald 1981; Dickson 2013), better public health (Cutler and Lleras-Muney 2006), women's empowerment (Sundaram and Sekar 2014), increased civic participation (Stoltz 2003) and other important indicators of development. Its intrinsic importance lies in the value that people accrue from simply having a particular piece of knowledge (Drèze and Sen 2002). For example, as Robeyns (2006) discusses, people may appreciate learning a foreign language for the way it sounds, rather than for its ability to expand their labour market opportunities or any other instrumental benefit.

As a result of this twofold importance, improving educational outcomes has long been prioritised by post-colonial Sub-Saharan African (SSA) states. Throughout the first wave of independence in the 1960s, education was viewed as a way to free an oppressed society from the shackles of colonially determined knowledge structures, thus allowing citizens to engage more fully with decolonial state-building (Mamdani 2016). Market-based structural adjustment programs of the 1970s and 80s reframed educational investment in more economic terms, emphasising the importance of strong levels of human capital in looking to harness market forces (Obamba 2013). Indeed, educational spending was one of the few sectors wherein states were encouraged to spend by policy-prescribing Bretton Woods Institutions (ibid). The 1990s brought increased globalisation, such that education was viewed as critical to compete in world markets (Scott 2000). Today, the justification behind educational investment incorporates elements of each paradigm, with the added complication of 'readying' the workforce for the Fourth Industrial Revolution (Gleason 2018).

More recently, information and communication technologies (ICTs) have been touted as a potential gamechanger for improving educational outcomes. African policy statements and national strategies for ICT development tend to be deeply optimistic regarding the transformational potential of ICTs, taking as self-evident that investment will necessarily result in improved outcomes (Friederici, Ojanperä and Graham 2017). This paper investigates this trend, focusing on three questions: (a) what discourses regarding the impact of ICTs in educational settings arise from the national strategies, (b) whether the claims made within these discourses align with the empirical evidence on this topic, and (c) where and why the strategies are aligned or misaligned with the evidence.

In answering these questions, this paper makes two key contributions to the literature. First, it adds to existing scholarship that critically analyses the content of national ICT strategies, providing a novel contribution through its particular regional and sectoral focus. Second, in discussing the drivers of the (mis)alignment between strategy and evidence, it contributes to our understanding of power and contestation over policy formulation in Sub-Saharan Africa.

The remainder of this paper is organised as follows. Section 2 provides a literature review, situating the twofold contribution within the relevant scholarship. Section 3 outlines the methodological approach, including a discussion on the paper's scope and data selection. Section 4 reports the findings, highlighting four key discourses arising from the national strategies. More particularly, the paper notes the claim that educational transformation is a single piece of inevitable ICT-driven socio-economic change. Further, the documents assert that ICTs in educational settings improve both access to and quality of education. Lastly, it discusses the notion that increased ICTs prepare societies for the 'modern world'. Section 5 analyses the results, finding that despite bullish strategy documents claiming near universal benefit, the empirical evidence on the efficacy of ICTs in education is largely inconclusive. Moreover, it notes that this widely held, overly optimistic understanding overlooks important potential dangers of ICT-in-education. The paper concludes with a discussion of why this misalignment occurs, suggesting that undue private sector influence and state perceptions regarding 'easy wins' interact to sustain an unempirical techno-optimism.

2. Literature review

As ICT integration becomes increasingly prioritised by governments, literature on ICT policy frameworks burgeons. Several studies look to summarise and analyse the commonalities and variation in rationales, claims and objectives within ICT policies. Korovkin (2019) investigates the themes of national digital development policies among African countries, finding that wealthier nations tend to have more comprehensive strategies. The World Economic Forum [WEF] (2017) also examines themes at a national level, classifying digital development strategies across four separate approaches. Namely, the paper notes *"Ensuring Innovation in Digital Governance and Access"*, "*Developing a Smart Society and Public Services"*, *"Growing the Digital Economy"* and "*Protecting Digital Infrastructure, Business and Fundamental Rights"* as the four approaches. Similarly, Kozma (2008) identifies four distinct rationales for ICT policies, focusing more narrowly on ICT in education policies. The author names economic growth, promoting social development, advancing educational reform and supporting education management as the key policy objectives.

These initial categorisation efforts also indicate that these policy documents are underpinned by the notion that ICTs have potential to impact both the educational sector and socio-economic trends more generally. Empirically, several studies support this notion across a range of ICT interventions. In terms of hardware and connectivity provision, ILC Africa and Worldreader (2012) find a positive impact on primary school reading scores resulting from the provision and integration of e-readers into the Ghanaian curriculum. This effect was particularly strong for students who received after-school educational support. In Kenya, Piper et al. (2015) evaluate the provision of tablets to supervisors and teachers alongside the provision of e-readers for students. This program results in significant learning improvements in both English and KiSwahili. In Peru, Kho, Lakdawala and Nakasone (2019) find that

connectivity leads to an initial moderate positive impact on math scores. However, perhaps more importantly, the authors find that this initial impact is persistent, and increases in magnitude over time.

Furthermore, there is some evidence that 'soft' interventions, including training programs and software provision, can also improve outcomes. One of the earliest studies of this nature evaluated the use of a software program aimed at improving mathematical skills in India (Banerjee, Duflo and Linden 2007). The authors find an increase in test scores, although the effect was largely driven by the impact on students at the bottom of the performance distribution. Similarly, Muralidharan, Singh and Ganimian (2019) evaluate a computer-aided after-school software initiative for middle-schoolers in India, which again presents positive results. More particularly, both math and Hindi test scores were significantly increased for all students, with the largest gains being made by academically weaker children.

However, the evidence on the efficacy of these interventions is inconclusive – there are a host of rigorous studies that find no impact of ICTs on educational outcomes. In some cases, these papers even note a causal decrease in academic performance. In a seminal education economics papers, Angrist and Lavy (2002) find that the installation of computers in several Israeli elementary and middle schools, through a programme called "Tomorrow-98", did not result in any improvement in educational outcomes, measured as standardised test scores. In fact, the researchers note a small negative impact in test scores at the 4^{th} grade level. Furthermore, Barrera-Osorio and Linden (2009), who evaluate the impact of a Colombian computer expansion program, note that the investment does not result in any improvement in academic performance. Similarly, Cristia and co-authors evaluate a One Laptop per Child (OLPC) initiative in Peru across a series of research papers. They find that the initiative increased proficiency in using laptops, but did not increase math or language test scores, did not improve cognitive skills and did not lead to any positive spillover effects across schools (Beuermann et al. 2015; Cristia et al. 2017). This group of authors also investigate the impact of computer expansion on dropout, repetition and enrolment rates, finding no significant impact (Cristia, Czerwonko and Garofalo 2014). More recently, Mora, Escardibul and Di Petro (2018) investigate a similar OLPC program in Spain, finding that the programme caused an average reduction in test scores of between 3.8-6.2%. In this case, the effect was more pronounced for boys than girls.

Evidence from 'soft' interventions is equally inconclusive. An evaluation of the impact of the American "Fast for World" initiative, a program aimed at improving linguistic and reading skills, found no significant impact on academic outcomes (Rouse and Krueger 2004). Similarly, in a report to the US Congress on the efficacy of reading and mathematics software, Dynarski et al. (2007) find that test scores were not improved in classes utilising the relevant products.

With this inconclusivity in mind, more investigative literature looks beyond summations of national strategies, aiming to understand *why* countries choose to pursue particular strategies, whether they are effectively realised and what barriers may exist with regard to actualisation. Farrell and Isaacs (2007), on behalf of InfoDev and the World Bank, prepare a summative report on 53 country surveys in Africa focusing on the policy environment for the integration of ICTs in education. The authors highlight common discourses arising from the surveys, including a focus on access and the notion of ICTs as catalytic for educational improvement. However, it notes several project failures, attributing these largely to poor or non-existent implementation, rather than initial policy design. Burns and Santally (2019) provide a similar report for the MasterCard Foundation. Here, the authors utilise qualitative data from interviews, focus groups and observational data to establish trends in the ICT-in-education policy environment and make recommendations in this regard. Again, this report finds that the policies correctly identify the potential of ICTs as a catalytic force for educational improvement, but that implementation and operating environment makes realisation of these goals very challenging. Tairab and Ronghuai (2017) support the aforementioned conclusions with a national level study set in Sudan. The authors note that various iterations of ICT policies identify that ICT integration will result in improved educational systems, but attributes poor outcomes to a combination of infrastructure gaps and poor implementation.

However, in a more critical literature, Livingstone (2012) posits an alternate explanation for various failures of ICT integration in education. This paper argues that poor outcomes arise largely as a result of policy *design* flaws, rather than *ex post* implementation issues. In particular, the author notes that ICT policies fail to recognise the *"demands of ensuring effective use"* (Livingstone 2010, p13). Several other studies support the notion that ICT policies tend toward unrealistic optimism with regard to their 'transformative' impacts while downplaying the potential barriers and downsides.

In analysing Egyptian ICT policy, Stahl (2008) uses a Habermas-inspired critical discourse analysis to establish that the claims centre around the emancipatory and empowering impact of ICTs, particularly with regard to democratic participation and educational outcomes. However, the author goes on to find that these claims do not accord with the social reality, and that the policies instead aim to legitimise certain departments and officials, rather than create empowerment. In this regard, the author argues that the policy is actively disempowering. In addition, Friederici, Ojanperä and Graham (2017) look to establish claims regarding the impact of connectivity on economic growth. The authors use a discourse analysis to investigate policy documents from national governments and relevant international organisations, finding that the claims are underpinned by overwhelming techno-optimism that does not accord with empirical evidence. This is attributed to particular vested interest among knowledge producers, who stand to gain from an optimistic paradigm through increased funding, sales or legitimacy.

Furthermore, this literature suggests that over-optimistic policies and the subsequent failures of actualisation arise not only through the inclusion of vested interests in the policy formulation process, but also through the systematic exclusion of individual citizens and other relevant, but less powerful, stakeholders. In Nigeria, Adeyeye and Iweha (2005) note lack of policy comprehensiveness arising from stakeholder exclusion as a barrier to improving ICT-related outcomes. In Pakistan, Palvia, Baqir and Nemati (2015) identify serious "design-actuality gaps" in ICT policy, largely attributing the relative failure to poor policy design that results from a lack of citizen involvement. More recently, Alghamdi and Holland (2020) compare policies and outcomes of ICT in education in Saudi Arabia and Ireland, finding that the policies and outcomes of both nations would benefit considerably from a more participatory policy design process.

It is thus evident that ICT policies aim to actively improve educational outcomes, but that these aims largely do not come to fruition. To some, including the World Bank and the MasterCard Foundation, the relative failure of these policies is attributed to difficult operating environments and poor implementation. A more critical literature views this explanation as insufficient, arguing that the content of the policies is disparate from social realities in the first instance. Moreover, this view posits that this is deliberate, as the policy process is influenced by vested interests incentivised to ensure a techno-optimistic policy environment. This paper looks to contribute to this debate through finding commonalities across Sub-Saharan Africa's national ICT policies, with a particular focus on the claimed impact on educational outcomes. This will be done by exploring three core questions:

1. What discourses around the impact of ICTs in education emerge from the national strategies?
2. Do the claims present in these discourses align with the empirical evidence?
3. What causes the alignment and/or misalignment between the claims and the evidence?

3. Methodology

Having established the inconclusive impact of introducing ICT interventions into educational settings, this paper turns to assessment of national strategies. This exercise aims to establish key discursive formations regarding the impact of ICT integration into educational settings. Once these have been established, they will be compared with the available empirical evidence. This comparative approach follows Friederici, Ojanperä and Graham (2017), who contrast the empirical evidence regarding the impact of connectivity on growth and development with the claims made in national policy statements and reports from relevant international organisations.

3.1. Scope

The data utilised for this discourse analysis stems from national ICT strategies within Sub-Saharan Africa. These documents are selected for three key reasons. First, and most simply, they are likely to make claims regarding the impact of ICT interventions on educational outcomes. Second, state policy documents are likely to influence the thoughts and actions of important actors within the relevant sectors. While the level of productive power varies across geographies, particularly where states are fragile, or areas where state-citizen interaction is minimal, national strategies are likely to exert at least some influence on most citizens. Third, national ICT strategies are reasonably comparable, in that they all have national scope, share the relevant topic and have been enacted relatively recently. In some cases, there are dedicated strategy documents for ICT in education, while other countries have embedded plans within sector-unspecific ICT strategies.

Furthermore, this paper deliberately restricts analysis to Sub-Saharan Africa. This is due to the region's unique combination of worst-in-class internet penetration and literacy rates, significant techno-optimism and increasingly influential ICT initiatives. As a matter of literacy, SSA's rate of 66% is the lowest in the world (World Bank 2020a). In terms of ICT usage, Table 1 below provides evidence with regard to the region's existing level of ICT integration. Even in mobile subscriptions, where SSA is commonly cited as a model for the rest of the world, the region lags significantly.

Table 1: Selected ICT indicators by region

REGION	INTERNET PENETRATION (% OF POP)	FIXED BROADBAND SUBSCRIPTIONS PER 100 PEOPLE	MOBILE CELLULAR SUBSCRIPTIONS PER 100 PEOPLE
EAST ASIA & PACIFIC	55	22.68	122
EUROPE & CENTRAL ASIA	80	28.08	124
LATIN AMERICA & CARIBBEAN	66	13.44	103
MIDDLE EAST & NORTH AFRICA	65	9.60	106
NORTH AMERICA	88	34.33	125
SOUTH ASIA	30	1.80	87
SUB-SAHARAN AFRICA	25	0.44	82
WORLD AVERAGE	50	14.49	106

Source: World Bank, 2020

This relatively low level of usage coincides with notable optimism in the developmental potential of increased ICT integration on the continent. This is evidenced by the finding that almost all national ICT strategies and external expert reports claim improving connectivity in

SSA will necessarily result in widespread economic and social development (Friederici, Ojanperä and Graham 2017). This optimism manifests in several private sector and international development projects, that view SSA as the last bastion of the under-connected world. Facebook, for example, recently announced intentions to build a 37 000km undersea cable, aimed at increasing internet connectivity. The project, dubbed "2Africa", is run in partnership with several multinationals including Nokia, MTN, Orange and Vodafone (2Africa 2020). Furthermore, Loon, a subsidiary of Google's parent company Alphabet, is looking to provide *"high-altitude communications technology"*, or hot-air balloons beaming internet to rural ares (Loon 2020). The World Bank's Digital Economy for Africa initiative offers strategy and financial assistance for a range of ICT interventions (World Bank 2020b) while the African Development Bank has pledged over $50 billion to support fibre expansion (African Development Bank Group, 2020).

The combination of the aforementioned factors indicates that attempted ICT integration across all spheres of life, including education, is a process that is likely to unfold on the continent at an increasingly rapid rate.

3.2. Data selection

It is important to acknowledge that comparisons at the regional level, as opposed to more granular assessments, are likely to obscure significant variation, particularly where the region is as large, populous and diverse as SSA. Certain countries may have relatively high penetration rates, or greater scepticism within state ranks regarding the developmental potential of increased ICT integration. By way of example, the small island economies of Cabo Verde, Seychelles and Mauritius all report that over 50% of their populations access the internet, while fragile East African states of Somalia and Eritrea report figures of less than 3% (World Bank 2020c). It is for this reason that we select strategies from countries with as large a degree of variation across key indicators as possible. In this regard, Table 2 presents the 17 reports selected for the sample, alongside relevant indicators.

Table 2: Selected ICT policies and selected indicators

COUNTRY	TITLE	GDP ($ BN)	ADULT LITERACY RATE (%)	INTERNET PENETRATION (% OF POP)
BOTSWANA	ICT Master Plan	18.62	86.82	47.00
CAMEROON	Strategic Plan for a Digital Cameroon by 2020	38.76	77.07	23.20
ERITREA	National Policy for ICT in Education in Eritrea	2.07	76.57	1.31
ESWATINI	National Information and Communication	4.41	88.42	47.00

	Infrastructure Implementation Plan 2012-2016			
ETHIOPIA	National Information and Communication Technology Policy and Strategy	96.11	51.77	18.62
GAMBIA, THE	The Gambia ICT4D Policy Statement 2018-2028	1.76	50.78	19.84
GHANA	The Ghana ICT for Accelerated Development Policy	66.98	79.04	39.00
KENYA	National ICT Policy	95.50	81.54	17.83
LESOTHO	ICT Policy for Lesotho	2.46	76.64	29.00
LIBERIA	Policy for the Telecommunications and ICT Sectors	3.07	48.30	7.98
MALAWI	National ICT Policy	7.67	62.14	13.78
MAURITIUS	National ICT Policy 2007-2011	14.18	91.33	58.60
MOZAMBIQUE	ICT Policy	14.93	60.66	10.00
NAMIBIA	Information Technology Policy for the Republic of Namibia	12.37	91.53	51.00
NIGERIA	National ICT Policy	448.12	62.02	42.00
RWANDA	National ICT Strategy and Plan	10.12	73.22	21.77
SOMALIA	Somalia ICT Policy and Strategy	0.92	n/a	2.00

Source: World Bank, 2020

3.3. Data analysis

With regard to the analysis of policy documents, this paper utilises a Foucauldian discourse analysis, as envisioned by Rose (2012). In this case, discourse describes *"groups of statements which structure the way a thing is thought, and the way we act on the basis of that thinking".* (Rose 2012, p136). Furthermore, this method accounts for intertextuality, or interdependence between various discursive formations. Overall, this process looks to establish formations with the ability to guide and discipline relevant actors' thoughts and actions; formations that have what Foucault (1972) refers to as "productive power". Note that this power is not repressive, or capable of removing free will, but is rather part of the construction of one's understanding of the world.

More particularly, the policies were read and summarised to identify particular codes, which look to establish claims regarding the causal impact of ICTs in education on developmental outcomes, with a particular focus on educational outcomes. These codes were then sorted into the four major discursive formations that emerged from the analysis. In addition, attention was paid to variation within each of the formations, cross-discourse assumptions and their engagement with empirical evidence.

4. Findings

4.1. ICTs can transform all sectors for the better – education included

The first discursive formation emerging from the reports is the notion that ICT integration will necessarily result in wide-reaching transformation of entire socio-economic structures. Educational transformation is presented as one of many upheavals that will occur, almost all of which deliver universally positive results. Take, for example, statements from the Botswana, Liberia, Rwanda and Somalia policies:

> *ICTs have had a revolutionary effect, fuelling globalization, enhancing governance and stimulating development in education, health and the business sectors. (Botswana policy, p3)*

> *The Government of Liberia understands the importance that ICT plays in the Poverty Reduction Strategy (PRS) policy, which promotes economic growth; improvements in infrastructure and basic service (Education & Health) delivery. (Liberia policy, p6)*

> *Global ICT policies have become more mainstream in the last decade underpinning growth, jobs, increasing productivity, enhancing the delivery of public and private services, and achieving broad socio-economic objectives in the areas of healthcare, education, climate change, energy, employment and social development. (Rwanda policy, p9)*

> *ICTs have a critical role in enabling socio-economic development with positive impacts on job creation, delivery of health care, education and research, and civic participation. (Somalia policy, p3)*

There are notable similarities across the statements. First, they present the 'transformative' impact of ICTs across a wide range of sectors as a strong statement of fact. This means there is no allowance for mediation, such as discussing the 'potential' of ICTs, or what their integration 'may' lead to. Second, there is no mention of potential downsides to integration. Third, there is no differentiation regarding sectoral variation. The statements imply that ICT integration across all sectors result in similar transformations. Finally, no empirical evidence is cited in support of the claims.

However, some policies are less direct in their assumptions. For example, The Gambia policy presents similar early assertions to those discussed above, namely presenting the impact of ICTs as universally positive without accounting for sectoral variation. However, this statement offers two important differences. First, it notes the 'potential' impact of ICTs, which leaves slightly more room for variation in outcomes. Second, it attempts to address the matter of empirical evidence. Unfortunately, the lack of a citation significantly detracts from the effort. The statement reads as follows:

> *Evidence from a number of developing countries shows that ICTs are being used to enhance rural development programs and improve the delivery of public services through computerization schemes – suggesting that the potential impact of ICTs on development can be enormous, particularly in terms of improved health, hygiene, nutrition and education. (The Gambia policy, p8)*

Overall, regardless of whether the statements allow for mediation, it is evident that the integration of ICTs in education is viewed as one part of a greater whole, wherein ICTs transform entire economies. Indeed, this particular discourse provides an 'umbrella' under which the remaining claims are situated.

4.2. ICTs in educational settings improve access to education, reducing the digital divide

Perhaps the most prominent discourse arising from the national policy documents is the notion that ICTs will directly result in more people receiving education. This is understood as a driver of decreased inequality. As a result, it is partly through this lens that ICT in education is linked to broader developmental goals. The policies vary regarding the extent to which they identify particular mechanisms through which ICTs can expand access. While some policies offer general statements noting the 'self-evident' relationship between ICTs and access, others identify distance learning and the expansion of lifelong learning opportunities as the two dominant channels through which access may be improved. Policies from The Gambia, Ghana and Malawi, for example, make general claims:

> *The Government of the Gambia (GoTG) is committed to prioritizing the process of the modernization of Gambia's educational system using ICTs and other emerging educational technologies […] to improve and expand on access […] and equity at all levels of the educational system (The Gambia policy, p42)*

> *The key role that ICTs can play in widening access to education to a wider section of the population; and in literacy education and for facilitating educational delivery and training at all levels has been recognized. (Ghana policy, p37)*

The following outcomes will be realized after implementing this policy: Increased access to basic health and educational facilities. (Malawi policy, p6)

Note the variation in strength with which these claims are made. The Malawian statement takes the relationship as positive and certain; policy implementation *will* lead to increased access. Policies from The Gambia and Ghana use less definitive language. Improving access is framed as conditional on government commitment in the former, while the latter states that ICTs 'can' – implicitly acknowledging that they need not necessarily – increase access to education. However, despite the differences, the policies do not identify mechanisms through which access will improve. Furthermore, the policies do not cite empirical evidence. Ghana's policy uses the passive voice to justify the claim ("*has been recognized*"), but does not engage directly with the literature.

Certain policies engage with the potential of ICT integration to create distance learning program – identified as a key mechanism through which access can be improved. The Eritrea, Ethiopia and Lesotho policies offer explicit statements in this regard. Eritrea makes a direct claim, while Ethiopia and Lesotho present distance learning as an objective that, with proper policy implementation, will lead to increased access. In a now familiar limitation, the statements do not engage with empirical evidence. Furthermore, the latter two policies use the exact same wording, as indicated below:

ICT will play a critical role through capacity enhancement and distance learning (Eritrea policy, p6)

Broaden access to education and training opportunities by promoting electronic distance education and virtual learning (Ethiopia policy, p15)

Broaden access to education and training opportunities by promoting electronic distance education and virtual learning. (Lesotho policy, p29)

The other common mechanism through which ICTs are expected to improve educational access, as per the discursive formations of national strategies, is through the expansion of lifelong learning opportunities. The ESwatini policy explicitly links life-long learning to distance learning, noting the importance of *"[exploiting] ICT in the provision of life-long learning through distance education programmes"* (ESwatini policy, p89). Other policies note the contribution of ICTs to life-long learning, without significant expansion:

ICT in education [is] a key contributor to improving the quality of education in Eritrea, and engendering life-long learning skills, such as information processing, critical thinking, and problem solving. (Eritrea policy, p3)

ICT has a great potential of making lifelong learning more readily available for everybody. (Mauritius policy, p10)

The claimed causality that leads from the aforementioned sub-discourses is that by increasing educational access, ICTs can indirectly reduce the 'digital divide', generally defined as inequality of opportunity, access and skill regarding digital technologies. This is articulated by The Gambia and Ethiopia policies:

> *As the vast majority of Ethiopian population lives in remote areas and gets low quality of education, ICT is crucial in addressing access and quality of education. (Ethiopia policy, p14)*

> *ICTs are making it possible to improve access to limited educational resources to a larger population. It is now possible through the use of ICTs to provide high quality education at an affordable cost to a wider population. (The Gambia policy, p8)*

The aforementioned statements offer a general view – that ICTs can reduce the digital divide across all sectors of the population. However, several policies address gender, disability and age as particular factors that may result in worse educational outcomes. The policies claim that ICTs can have a catalytic impact in overcoming these concerns. The Botswana, Lesotho and Liberia policies are illustrative:

> *Key strategies implemented include developing national ICT policies to promote the establishment of information- and knowledge-based societies. These can be a foundation for wealth creation and can assist in accelerating progress to achieve the MDGs, such as […] gender equality. (Botswana policy, p2)*

> *ICTs can provide a powerful means for reaching out to youth and women and including them in the development process. Access to ICTs can have an empowering effect on youth and women through the acquisition of new skills and exposure to opportunities. (Lesotho policy, p46)*

> *It can be used to reduce inequalities in gender and to also improve the lives of the disabled with the necessary technologies that can enable them to communicate more effectively with the world. (Liberia policy, p40)*

In short, the policies claim that ICTs will increase educational access, largely through distance and lifelong learning opportunities, which in turn will reduce the digital divide, with particular focus on their potential to address gender, disability and age inequalities. Without critical examination, it offers a largely plausible story. However, there is a major limitation regarding aforementioned discourse, unaccounted for in the policy statements: the process is presented as linear. If the policies are implemented, the positive outcomes will be achieved. This does not account for adverse effects that may arise from ICT integration. In this regard, there is an equally plausible theoretical prior wherein ICT integration *increases* inequality of educational outcomes, which is discussed further in Section 5. Empirical evidence can provide

guidance on which prior is more likely to occur, which, as noted previously, the strategies do not address.

4.3. ICTs in educational settings improve the quality of education

While the policies suggest that ICTs will widen access to education, they also extol the likelihood of improving the *quality* of said education. For example, the Cameroon policy (p49) notes that generalising *"the institution of ICT programmes in schools"* can *"ensure the availability both in terms of quality and quantity".* This is supported by the Mauritius policy (p10), which states that *"the effective usage of ICT in education is seen as a very important aspect in improving learning methods [and] the quality of education"*. Note the wording of the Mauritian statement in particular – employment of the passive voice avoids engagement with empirics.

Two mechanisms through which quality improvements are expected to occur are identified. First, ICTs are expected to increase efficiency in management and administration, and second, to increase access to teaching and learning resources. The Eritrea and Somalia policies make strong claims regarding the former, as evidenced below.

> *ICT infrastructure and interconnected network will be procured and installed throughout the entire administration sector of education, and utilized to its fullest extent for a more efficient management of information. (Eritrea policy, p3)*

> *Increased use of ICTs will help to support both administration and teaching in the educational sector. (Somalia policy, p31)*

Most other policies make slightly 'softer' claims, wherein they note the potential for managerial and administrative improvements, or frame the improvements as conditional on government commitment. These statements also identify some mechanisms through which efficiency improvements could reasonably be expected to occur, such as administrative support systems and increased standardisation. However, they do not identify if there are ways in which managerial processes may be hindered by systems change. Furthermore, there are no sources cited to support their identified mechanisms. Statements from the Mozambique, Nigeria and Eswatini policies are illustrative.

> *There are however various opportunities that ICTs offer in the education sector, [including] administrative support systems, ranging from matriculations, exams and the location of teachers, to financial management (Mozambique policy, p12)*

> *Broadband has the potential of enabling entire new industries and introducing significant efficiencies into education delivery (Nigeria policy, p28)*

> *[Government commits to] guiding the successful integration of ICT in the education system - ensuring standardisation, reducing wastage and ineffective use of technology thereby optimising technology use in enhancing teaching and learning; (ESwatini policy, p8)*

Within this discourse, education quality is also expected to improve as a result of greater resource availability for educators and students, primarily through increased internet access. Two statements from the Rwanda policy, seen below, demonstrate this particular discursive formation. The assertions use the word 'can', allowing for some outcome variation.

> *Primary, secondary, vocational and tertiary education can be enhanced through ICT education and training tools, e-learning, content development and access to educational resources, in order to foster innovation. (Rwanda policy, p22)*

> *ICTs can be leveraged as effective educational tools. Training teachers in ICTs will increase their resource base and improve education delivery, hence the need to institutionalize ICT usage and training for all teachers. (Rwanda policy p30)*

Thus, it is evident that the strategies suggest that ICT integration will result in improved quality of education, largely through improvements to managerial systems and increased access to teaching and learning resources. There is little specification regarding the particularities of both channels, and no peer-reviewed sources are cited in support.

4.4. ICTs in educational settings prepare students and society for the challenges of the modern world

The final discourse furthered by the national strategies builds upon the assumptions of the three aforementioned, asserting that integrating ICTs in education prepares individuals and the country as a whole for a twenty-first century; a century expected to be deeply impacted by the fourth industrial revolution. Different strategies use varying terminology to portray a common image of the modern world, including *"networked world"* (Botswana policy, p46), *"digital economy"* (Cameroon policy, p37), *"swiftly changing society"* (Eritrea policy, p4) and *"knowledge and information age*" (Ethiopia policy, p14; The Gambia policy, p42). Policy objectives are largely framed as 'readying' the populous for this conception of the world.

In looking to deliver these skills, some policies explicitly discuss increased integration of STEM education into curriculums, justifying this choice through analysing the needs of the aforementioned conception of the world. Eritrea, The Gambia and Ghana each offer commitments in this regard:

Science and Technology and ICT will be at the heart of the new curriculum at all levels in order to cope with the rapidly developing technology and swiftly changing society (Eritrea policy, p4)

To promote awareness and participation in science, technology and innovation (STI) to increase the number of students offering STI- related areas at all levels (both formal and non-formal) of the education system (The Gambia policy, p32)

Strengthen science education at all levels and in all aspects of the educational system, especially at the basic and secondary levels (Ghana policy, p39)

However, several strategies do not offer specific commitments, rather claiming that ICT integration in educational settings will necessarily improve ICT-related human capital. The Cameroon policy (p37), for example, notes that IT integration can lead to *"human competences likely to meet the needs of the digital economy"*, while the Kenya policy (p8) states that *"integration of digital technologies into the educational and vocational systems at all levels [can] ensure that our current and future workforce is prepared for the changes that are happening now.*" The Namibia policy (p7) concurs, noting that ICT integration aims to *"produce people capable of working and participating in the new economies and societies arising from ICT and related developments".*

Where the discourse on improving access alludes to broader developmental goals regarding equity, this discourse is linked with goals regarding growth. The presentation holds that a better-educated population results in a country that is better able to compete internationally, and implicitly, to grow. Policies from Eswatini, Ethiopia, The Gambia and Ghana all explicitly link increased individual ability with societal competitiveness in this manner, as evidenced by the statements below.

In order to compete in a competitive global economic environment, a highly skilled and educated workforce with aptitude and skills in the application of ICT's is essential. (Eswatini policy, p87)

ICT facilitates the development of education and enables both individuals and countries to meet the challenges presented by the knowledge and information age (Ethiopia policy, p14)

… make the educational system responsive to technological advancement and to meeting the needs and requirements of the economy and society with specific reference to the development of the Gambian information and knowledge-based economy and society (The Gambia policy, p42)

> *[We aim] to transform the educational system to provide the requisite educational, and training services and environment capable of producing the right types of skills and human resources required for developing and driving Ghana's information and knowledge-based economy and society (Ghana policy, p22)*

In short, the policies share a particular conception of the modern world; one where technological change will render countries unable to engage on a global stage if the population is not sufficiently prepared. In this conception, ICTs in education will provide this preparation, which in turn can be an important driving factor in achieving economic growth.

5. Discussion

5.1. Claims and empirical evidence

The national strategy documents make four major claims. First, that ICT-related transformation is inevitable across all sectors, and that education will be no different. The second and third claims identify the ways in which education is likely to be transformed, extoling the likelihood of increased access and quality. Fourth, the policies argue that the combination of an inevitably changing world and better access to and quality of education means that ICT-integrated education is uniquely placed to prepare individuals, and indeed societies at large, for the "rapidly changing environment". This narrative is common across the sample.

However, there are notable concerns regarding the aforementioned claims. First, as noted *ad nauseum*, there is minimal engagement with the empirical literature. Most claims did not refer to peer-reviewed literature at all, instead taking the assertions as self-evident. In some cases, statements utilise the passive voice, or vaguely note the experience of other countries to justify claims. In no cases did the strategy documents offer footnotes or citations. This is clearly poor practice as a matter of academic rigour, but as a matter of pragmatism, the potentially harmful consequences are reduced if the claims are aligned to the empirical evidence, regardless of explicit engagement. This section investigates, finding that there is no consensus on any of the discourses aforementioned. In other words, the claims do not align with the evidence.

5.1.1. Socio-economic transformation

Recall the first discourse, which frames educational transformation as one of many socio-economic changes that result from inevitable ICT integration, which is expected to lead to near-universal positive impacts. However, there are notable problems with presenting ICTs as universally transformative. It would be wholly incorrect to suggest that ICTs will not have, and have not already had, some notable impacts on socio-economic landscapes. The classic example regarding SSA is the introduction of mobile money. Indeed, a well-cited study published in *Science* provides evidence that M-PESA lifted 194 000 Kenyan households out of

poverty (Suri and Jack 2016). However, this finding has been strongly debated, where accusations of methodological sloppiness were put forward (Bateman, Duvendack and Loubere 2019). This debate provides a fitting example of the difficulty of identifying the impact of ICTs on broader society.

Some studies, largely using cross-country regressions, find positive results on the impacts of improved ICT penetration rates (Vu 2005; Sassi and Goaied 2013). However, there are methodological concerns regarding these papers, in that cross-country regressions struggle to control for omitted variable bias. This concern is so significant that the World Bank's World Development Report notes that the methods are "*inappropriate tools"* for assessing the impact of ICT integration on economic growth (World Bank 2016, p56). Indicatively, several broad literature reviews find inconclusive results (Friederici, Ojanperä and Graham 2017; Lwoga and Sangeda 2019). This inconclusivity shows that ICTs do not cause an inevitable socio-economic uptick and as such, the notion that education will be 'swept up' in this transformation does not hold true. Moreover, this narrative has the potential to distract from important sector-specific challenges and mediating factors that must be considered in looking to use ICTs to improve outcomes.

5.1.2. Expansion of access

The second discourse identifies a particular route through which ICT integration is expected to transform education – namely through the expansion of access, particularly through increased availability of distance and lifelong learning opportunities. This, in turn, is expected to reduce the digital divide. The theoretical case is plausible, in that integrating connectivity and/or hardware into educational settings necessarily increases the ease with which students can physically access these technologies and subsequent educational resources. However, recall from Section 2 that increasing computer access and connectivity does not automatically improve educational outcomes, suggesting that there are mediating factors between access and success unaccounted for by the national strategies. This can be explained by understanding the 'second-level' digital divide (Hargittai 2001).

This broader definition accounts for the roles of motivation, existing skillset, emotional affect and other individual characteristics that influence the ability of individuals to actually use the technology that can be physically accessed (Van Dijk 2017). For example, Huang, Cotton and Rikard (2017) find that among fourth- and fifth-grade African-American students, the existence of a home computer is a key predictor of ICT utilisation. Furthermore, a related study on the impacts of ICT learning at a Canadian university finds that computer self-efficacy reduces ICT-related anxiety, which in turn increased perceived ease of use (Saadé and Kira 2009). These results have two important implications. First, it shows that greater returns to ICT interventions are most likely to accrue to those with an existing skillset. Second, given that existing ICT skillset is correlated with higher levels of income, there is clear evidence that

introducing ICTs into educational settings can actively *increase* digital divides (Van Dijk 2006; Hargittai 2010).

Understanding the ambiguity with regard to the direction of impact of ICTs on digital divides should encourage more reflexivity among national strategists. In this framework, making investment decisions is a matter of assessing trade-offs. It may be that ICT interventions benefit certain individuals or educational institutions more than others, but that the average level of second-level access increases such that the investment is justified. However, the policy documents do not properly account for the potential downsides, and thus do not engage with this 'trade-off' framework.

5.1.3. Improvement of quality

Beyond access, a further major claim made by the national strategies is that ICTs in educational settings will improve the overall quality of education, through improvements to administrative efficiency and increased resources for teaching and learning. Indeed, there is evidence to suggest that teachers' primary usage of ICTs is for administrative purposes (Mumcu 2010). Empirical evidence shows that, in some cases, this results in improved efficiency. In Malaysia, there is evidence that ICT integration improved informational access for administrators, which in turn led to better resource utilisation and more efficient management. Itodo (2018) investigates the efficacy of ICT integration on managerial efficiency in Nigerian universities, finding improvements in record-keeping and information exchange that arise from computer services, internet connectivity and satellite broadcasts. However, there is little consensus, as several studies present evidence to the contrary. In particular, the literature suggests potential for increases in teacher workload and worsened administrative efficiency, largely as a result of needing to retrain for new systems (Frederick, Schweizer and Lowe 2006; Honan 2008; Goktas, Yildirim and Yildirim 2009). Importantly, even in the case where ICTs do improve administrative systems, it is unclear that this efficiency causes an educational quality increase.

The strategies also note a potential quality increase occurring as a result of increased access to learning resources. In this regard, equity concerns, analogous to those raised in the discussion on educational access, arise. Where ICTs increase educational resources, educators and institutions who already have a decent level of ICT literacy will be best able to identify and utilise new educational resources – a skillset highly correlated with level of development (Van Dijk 2006). Furthermore, even where new resources are identified and integrated into teaching, this does not necessarily result in quality improvements, particularly as students face adjustment costs that disproportionately impact lower-income learners. It is important to note that there likely *will* be cases where ICT integration does improve educational quality and subsequently improves learning outcomes. This section simply aims to highlight that this process is not automatic, in contrast to the propositions of the national statements.

5.1.4. Unique preparation

The final discourse furthered by the strategies is the notion that ICTs in education uniquely prepare students for the challenges of the modern world. In some ways, empirical evidence supports this proposition. A randomised experiment in Argentina and Colombia finds that having ICTs on one's resume increases the possibility of a post-interview call-back (Blanco and Lopez-Boo 2010). This appears to translate into labour market outcomes: Walton et al. (2009) find that ICT skills are both a predictor of employment and higher income. More specifically, Falck, Heimisch and Wiederhold (2016) find that a one standard deviation increase in ICT ability results in an average wage increase of 8%. However, these micro-level findings do not translate to the macro-level. As previously indicated, there is no consensus on the impact of ICTs to generate economic growth. This macro-micro paradox is analogous to findings on the impact of both education and aid, where promising micro-level findings do not aggregate upward. While there is little empirical evidence explaining this, Pritchett (2001) offers a two-fold framework for understanding the education paradox, which likely holds lessons for the ICT paradox. First, he proposes that education assists people in pursuing privately rewarding but socially wasteful activities, such as rent-seeking financiering. Second, he offers an alternative explanation wherein the quality of education is so poor that it provides a 'signal' of productivity without providing *actual* labour market productivity. Both explanations are plausible with regard to the impact of ICT skills. As a result, state investment in individual-level ICT preparation may not result in societal benefits; a factor unaccounted for in the national strategies.

5.2. Investigating misalignment

It is thus evident that the national strategies present a cross-cutting, techno-optimistic vision of ICTs in education which is disconnected from the available empirical evidence. These statements are influential documents, whose frameworks and implementation plans guide the ways in which states engage with ICTs, education and development more broadly. Thus, misalignment with empirical evidence presents significant danger to developmental hopes, particularly where notable downsides are unaccounted for. First, there is the danger of wasteful expenditure, which is particularly concerning in low-income contexts. Second, and perhaps more concerningly, there is the danger that integrating ICT into educational settings will exacerbate existing problems, such as inequality of educational outcomes, or create new ones, such as computer-related anxiety.

Thus, it is important to examine *why* these statements remain rife with unempirical techno-optimism, in order to understand how to disrupt these processes. This section investigates, finding that a rapidly expanding, technologically-enabled international private sector has both the incentive and power to shape national strategies in their favour. As a matter of incentive, techno-optimistic national policies allow for the harnessing of Big Data and subsequent cementing of market position, alongside a 'remoralisation' project justified by the concept of 'Shared Value'. As a matter of power, major private sector firms harness significant capital

together with the aforementioned 'Shared Value' narrative to enjoy an ever-increasing influence in both international organisations and arms of the state. This process is supported by a lack of resistance among African governments, driven by the visible short-term 'wins' that ICT integration can provide.

5.2.1. Big Data

So why does an overly optimistic understanding of the developmental potential of ICTs in education benefit the private sector? The first reason relates to a key input in the operating models of major technology firms – data. ICTs in educational settings can improve data availability and reliability, including but not limited to test scores, attendance rates and fee payments. In this regard, there is a compelling case to be made regarding the potential developmental impact of Big Data in education. First, more data can allow better evaluation of particular lesson plans or teaching techniques (West 2012). Second, it may allow for predictive assistance regarding which students need more help, which in turn could reduce failure or drop-out rates (Drigas and Leliopoulos 2014). Finally, more data means that potential employers can access more detailed information on potential employees, which can improve employer-employee matching (ibid). While the national strategies don't explicitly acknowledge the aforementioned mechanisms, they align neatly with claims regarding the impact of ICTs on educational quality and administration systems.

However, notwithstanding evidence suggesting that these benefits may not arise as discussed in Section 5.1.3., critical literature argues that the Big Data integration in developing countries is less motivated by developmental potential, and more by profit-seeking international firms who are best able to monetise the information. Most directly, increased data availability means that firms are better able to build behavioural profiles of individuals and societies more generally, which can be utilised in several ways. First, and most directly, more data means better targeted advertisements, which are more likely to be converted into sales (Malik 2013). By way of example, a student with lower test scores may be shown advertisements for technical colleges rather than universities. Second, Big Data can identify susceptibility to 'nudging' or using small cues to influence an individual's behaviour (ibid). This, in turn, can be used to influence political decision-making or purchasing patterns in ways that assist the relevant international private actor.

Furthermore, it is important to note that digital platforms display monopolistic tendencies through network effects (Khan 2016). In other words, companies with more data are able to accrue greater returns to additional data. For example, if a firm knows a students' test scores, it will be able to generate certain predications about their behaviour. However, if a firm knows a students' test scores, location history and purchasing history, it will be able generate a more complete profile of the individual, which can be harnessed to generate more accurate predictions of behaviour. This results in significant entry barriers for other firms, who are less

able to provide deeply targeted services. Thus, Big Data collection can cement the market power of major technological firms.

5.2.2. Remoralisation and Public-Private Partnerships

The second key incentive for the private sector to present a positive picture of the impact of ICTs in education is with regard to the firms' societal purpose and reputation. Governments around the world are becoming increasingly concerned with the influence of Big Tech across a number of domains, namely privacy violations, anticompetitive behaviour, poor worker conditions, the ease with which platforms are manipulated for political gain and the tendency for algorithms to create dangerous 'echo chambers'. This concern was plainly seen at recent antitrust hearings at the US Congress, where the CEOs of Apple, Facebook, Google and Amazon were questioned on the aforementioned issues by lawmakers from across the political divide (Baer 2020).

Concurrently, in the international development space, there is an arguable paradigm shift occurring, which highlights the potential of the private sector to improve development outcomes (Bayliss and Van Waeyenberge 2018). The theoretical framework underpinning the rise of the private sector in development is one of 'shared value', developed by Porter and Kramer (2011). This view holds that capitalism is the best available economic system for addressing human needs, but that societal harm has arisen from private firms pursuing a narrow conception of value creation; namely shareholder value maximisation. This, in their view, explains various problems, including but not limited to climate change and inequality. In place, they propose that the private sector should identify 'win-win' opportunities, such that they are able to fulfil their profit-making objectives while actively addressing societal needs. This is presented as the solution to a capitalism that is *"under siege"* (Porter and Kramer 2011, p1). Along these lines, a litany of Public-Private Partnerships (PPPs) has been created, despite compelling concern that this paradigm distorts the drivers of development interventions away from need, and toward profit (Bayliss and Van Waeyenberge 2018).

Thus, if private sector firms, particularly in Big Tech, can present their work as critical for developmental purposes – such as improving educational outcomes – they can harness the PPP paradigm to 'remoralise' their purpose. More particularly, highlighting the developmental impact of their work offers a convincing counter-frame to the notion that these firms are privacy-violating and anticompetitive monopolies.

5.2.3. Power and policy space

It is clear that international private sector firms would benefit from a techno-optimistic account that allows them to harvest data while providing a socially minded counternarrative to present to competition and privacy authorities. However, this incentive can only be realised if firms have the requisite power to substantially influence policymaking at a national level.

Further examination shows that not only do these firms have the requisite power, but that they utilise it regularly, particularly in the formation of national ICT strategies.

Power in national ICT policy stems primarily from the interaction between global capital, governments, academia, international organisations and civil society (Makoza 2017). In this framework, the international private sector already holds significant sway in the first instance, given a significant endowment of capital. This capital is often wielded to exert significant but indirect influence on policy formation, where 'indirect' refers to some degree of separation between private actors and the policy-writing process. For example, firms can promise employment opportunities or improved connectivity in return for 'enabling' regulatory environments, which may include tax breaks or labour law exemptions. Where market power is consolidated, these firms have increased leverage (Khan 2016).

However, private sector firms often utilise capital to more directly influence the policy formulation process, largely through the formation and funding of working groups and consultative forums. For example, in the formation of the Rwandan policy, the state engaged with CISCO Systems Networking Academy, where direct knowledge transfers occurred (Mwangi 2006). In Kenya, early ICT policy was developed primarily by the National Millennium Bug Committee, which was chaired by a Unilever senior executive, and whose make-up is described as *"heavily private sector oriented"* (Eldon 2005, p45). Furthermore, Adeyeye and Iweha (2005), in analysing the formation of Nigeria's national ICT policy, find that although several stakeholders contribute, the private sector is the primary driver of inputs into the policy process.

It is also important to note that national ICT policies often draw heavily on international discourse. Two particularly influential actors in this regard are the International Telecommunications Union (ITU) and the World Bank. The former is an international body that encourages coordination of ICT regulation. The latter is arguably the world's most influential international development organisation, including in the matter of ICT policy. These organisations produce several best practice reports and readiness indices which are utilised in the policy process, particularly within developing countries where internal expertise may be limited (Mwangi 2006). However, neither the ITU nor the World Bank are immune to narratives surrounding 'Shared Value'. Indeed, the World Bank is a major proponent of increasing private sector influence for developmental purposes; an ideological position rooted in decades of encouraging market-led development (Bayliss and Van Waeyenberge 2018). These arguments raise the salience of the private sector's capital availability, noting the 'financing gap' that must be overcome in pursuing economic development, while downplaying domestic resource mobilisation options (ibid). As a result, a techno-optimistic, private sector-led narrative is also furthered internationally, which has two consequences. First, it legitimises the position of existing statements, such that contestation is reduced. Second, in countries where the balance of policy formulation is weighted more

heavily toward external actors, private sector firms do not need to engage directly with the relevant state to ensure a techno-optimistic policy framework. This goes some way to explain how a country like Somalia, with extremely limited international private sector presence, produces policies aligned with countries like Nigeria or Ghana.

This process is a virtuous cycle for private actors. As their policy influence increases, so does their profit and market power, which in turn improves their policy leverage. However, while it is evident that private sector policy space can 'snowball' at the expense of the government, it is important to acknowledge a level of state agency throughout this process, particularly in regions with relatively strong state capacity. For example, evidence from Mauritius suggests that the state exhibited a larger degree of influence in ICT policy formulation than other African countries (Adam and Gillwald 2007). However, the discourse arising from its policy aligns neatly with the other strategies, which can be attributed largely to 'easy wins' that ICT in education can provide for politicians. In particular, the provision of ICTs to students can be a very tangible and optic example of government service delivery, particularly as it pertains to providing institutions with hardware such as laptops or tablets. Where the techno-optimistic paradigm holds, the extension of visible ICT provision is that the government is perceived to be directly improving educational outcomes and employment prospects, without needing to actively provide evidence. Thus, state officials looking to improve their standing among constituents benefit notably from this understanding of the impact of ICTs in education.

6. Conclusion

In short, this paper identifies four key discourses regarding the impact of ICTs in education, emanating from national ICT strategies among Sub-Saharan African countries. Namely, the policies claim that ICTs can transform entire socio-economic structures, improve access to education, improve the quality of said education and better prepare students for the challenges of the modern world. In their totality, these claims are underpinned by significant optimism regarding their potential impact of technologies. The paper then investigates how empirically grounded this techno-optimism is, finding significant disparities between the claims and the best available empirical evidence. This gap, in turn, could result in significant wasted expenditure or harm to key developmental outcomes.

It then investigates the major drivers of this continued lack of empiricism – identifying an influential private sector and governments that see 'easy wins' in ICT integration as key. More particularly, the private sector stands to benefit from this techno-optimistic narrative due to an increased ability to harvest data, increase market power and 'remoralise' their activities. Importantly, firms are able to act on these incentives both directly and indirectly, through influencing both the policy-writing process itself and the external narratives that legitimise said policies. This influence is actualised through a combination of significant capital resources and the harnessing of 'Shared Value' narratives that promote the developmental potential of

the private sector. In short, this paper accords with a critical literature that attributes continued gaps between ICT policies and social realities to the influence of vested interests in the policy formulation process.

This conclusion should not be misinterpreted as an argument for the arresting or the removal of ICTs in educational settings. As noted above, the evidence on the efficacy of ICTs is mixed – not uniformly negative. As a result, the paper rather urges more caution and reflexivity in the planning process, to better account for the inconclusivity of the existing evidence base. Having said this, it is important to acknowledge the structural power dynamics that maintain the existing paradigm.

In this regard, this paper identifies two areas of action, aimed at encouraging a more balanced policy formation process. First, this paper recommends encouraging and supporting countervailing sources of power. Recall from Section 5 the areas from which power stems in the ICT policy formulation process: capital, government, academia, international organisations and civil society (Makoza 2017). This paper's analysis discusses the ways that private sector influence impacts the submissions of both government and international organisations. While it would be naïve to posit that the remaining areas – civil society and academia – are wholly independent, or free from perverse incentives from within their own structures, their increased engagement offers an opportunity for valuable contestation. In this regard, governments should inculcate a participatory culture of policy formulation that includes a diversity of academics and civil society actors.

However, while the realisation of participation in policy formulation would be helpful in reducing unempirical techno-optimism, it relies on either the benevolence of state leadership or particularly activist academic and civil society factions, neither of which are guaranteed. In addition, it does little to address structural forces that create the reliance on the private sector in the first instance. For this, developing states need to remain focused on the arduous task of socio-economic structural transformation, which includes competition enforcement, industrial policies, domestic resource mobilisation and investment in local knowledge production. These are, of course, long-term initiatives filled with political contestation and social upheaval, but they are necessary for the pursuit of development – educational improvement included.

7. References

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