

Mobile phones and education in sub-Saharan Africa: from youth practice to public policy

Introduction

Young people's use of mobile phones has expanded dramatically across sub-Saharan Africa over the last decade in both urban and rural contexts (de Bruijn et al. 2009; XXX et al. 2012). In their 2012/13 Africa Development Indicators report, the World Bank noted that over 80 percent of urban people in Africa had access to mobile phones: this may well be an underestimate. Handset prices have plummeted and the smart phone is now an essential accoutrement of 'cool' youth, whether they are rich or poor: even in very remote rural areas, basic mobile phones are increasingly accessible to (if not owned by) young people.

In formal education, internet access (whether through PC or mobile phone) is recognised, worldwide, to have enormous potential to expand pupil learning opportunities, not merely in terms of enabling easier access to information directly relevant to the curriculum, but also in helping to give pupils voice and agency as they explore their their place in the world (Valkenburg and Peter 2011; Hughes et al. 2013; The Economist 2013). However, negative impacts of mobile phone usage (especially, but not only, relating to internet access) are also emerging among school-age children, in both the global North and South (Cook et al., 2012; Stark 2013; Strassberg et al. 2014). As yet, detailed published research on the impact of mobile phones on youth in educational contexts in sub-Saharan Africa is sparse, though smart phone proliferation is certainly changing ICT access dramatically for Africa's pupils (Farrell and Isaacs 2007).

Through this paper we aim to contribute to demands for a more substantial body of evidence in African contexts. Our mixed-methods field research in 24 sites across Ghana, Malawi and South Africa, and associated discussions with mobile phone network providers, educational institutions and policy makers, suggests that while there are some positive aspects of mobile phone use for African pupils, their down-side is also becoming increasingly apparent, especially in urban and peri-urban sites. We start with some background (key literature; study methodology; phone ownership and usage), then chart available evidence of positive educational value of mobile phones in our research sites before moving on to examine a

range of negative impacts associated with youth (and teacher) practice. We then ask: how, and to what extent, should and can public policy address issues such as phone-related classroom disruption (whether caused by pupil or teachers' phones), lengthy periods spent by young people on social network sites, disruption in adolescent sleep patterns associated with cheap night calls and widespread circulation of pornography? The final section of the paper considers the potential to address some of the most negative aspects of phone use in educational contexts and to promote more positive aspects through engagement with policy makers.

Background to this study

Key relevant literature

Of particular significance to the ensuing discussion is a series of UNESCO working papers. *Turning on mobile learning in Africa and the Middle East* (UNESCO 2012a) looks to better understand how mobile technologies can be used to improve educational access, equity and quality, through a review of mobile learning initiatives from 2006-2011, albeit restricted to informal interviews and literature reviews. It emphasises how mobile phones have the potential to substantially expand pupil learning opportunities, by enabling access to information directly relevant to the curriculum, but also points to constraints to achieving that potential. Overall, its emphasis is on the 'dearth of evidence-based research on mobile learning ... and the need to grow a body of evidence' (p. 8). Certainly, public sector initiatives for evidence-based studies often suffer from lack of adequate monitoring and evaluation, as Beger and Sinha 2012 emphasise in a South African context.

Some key findings of this UNESCO (2012a) publication are particularly pertinent to the discussion which follows: (i) most mobile learning projects are just pilots, with no attempt to influence national policy; (ii) anti-mobile sentiment appears to be a significant barrier to mobile learning, underpinned by phone disruptions in school, which have led many schools to ban pupils' phone use on school premises, and by media sensationalisation of negative phone stories which has promoted moral panic; (iii) some governments (including South Africa's Department of Education), have established e-Safety committees to promote safe, responsible use of technologies in school: students need to be taught the importance of making informed choices about behaviour in virtual environments. This latter point is also at the core of a recent review by Livingstone and Bulger 2013, which emphasises that, despite

as yet very limited research in developing countries, emerging patterns suggest that where parents and teachers have less training and support in internet use, children engage in more risky behaviours online, including contacting and sharing pictures with strangers and giving personal information. For girl pupils, there may be particular issues around harassment, sexual relationships and exploitation specifically related to cell-phone acquisition and use (Cook et al. 2012; Bose and Coccaro 2013).

Small UNICEF-supported studies in Kenya and South Africa (UNICEF 2011; InterMedia/UNICEF 2013; CJCP/UNICEF 2013) not only emphasise this vulnerability of young people, but also parents' common lack of understanding and use of digital media, especially in poor communities, which means that the role it can play in aiding education and learning is rarely addressedⁱ. While recognition of the need for greater preparedness in schools is growing (Bose and Coccaro 2013), it is difficult for schools to keep pace with the rapidly changing availability of phones and their expanding functionality: most knowledge has been obtained in the Global North - its relevance in the South is largely untested.

Methodology

This paper draws from an ongoing study of young people's mobile phone usage and its impacts across Ghana, Malawi and South Africa. Field research has been conducted in 24 sites since 2012, along a spectrum from urban high density neighbourhoods to remote rural locations, in two different agro-ecological zones in each countryⁱⁱ. However, our knowledge of these sites extends back to 2006, when we first commenced research into the physical mobility of a cohort of children 9-18 years (XXX et al. 2012). Our age focus has expanded to 9-25 years in the current study, though our focus here on pupils in primary and secondary education usually implies a cut-off at around 22 years.

Data collection in the current project has three central components: (i) thematic story-based interviews which explore a diversity of themes concerning young people's everyday and more exceptional phone experiences, including in educational contexts (but also job search, livelihoods, health etc.); (ii) call register interviews which consider young people's contact lists on their phone or sim card and their mostly mundane, everyday phone interactions over the last day or so, including recent calls, texts, time on social network sites etc.; (iii) a questionnaire survey of c. 1500 young people per country, including specific questions regarding their use of phones in educational contexts (i.e. c. 1000 aged 9-18 years, and c. 500 aged 19-25y, evenly distributed across the research sites; sampling across settlement transects

in each site, with random selection within households). Additional activities include: (iv) focus groups with young in-school and out-of-school people and with parents and other older people; (v) essays by school pupils; (vi) key informant interviews, including with teachers and settlement leaders; (vii) life histories with people in their late 20s to mid-30s about the changing impact (or not) of mobile phones on their lives; (viii) Country Consultative Group meetings, established at the start of the project as discussion fora for debating ongoing findings with a wide group of stakeholders including policy makers, practitioners and commercial network providers and representatives of youth groups. Through this diversity of methods we have been able to amass substantial data sets relevant to the education theme.

Phone ownership and usage expansion

An indication of the scale of expansion of mobile phone ownership and usage in our research sites can be provided by comparing survey data for those aged 9-18 years in 2007/8 with the same age group in 2013/14 (a total of approximately 1000 respondents per country in each survey year). Ownership of mobile phones (all types) increased, between 2007/8 and 2013/14, from c. 0.6% to 8.4% in Malawi (i.e. increased by 1,300%); from 2.4% to 16.2% (increased by 575%) in Ghana; and from 21.0% to 50.8% (increased by 142%) in South Africa. Usage in the week prior to survey, meanwhile, expanded from 9.3% in 2007/8 to 34.7% in 2013/14 (i.e. increased by 273%) in Malawi; from 16.7% to 41.6% (increased by 149%) in Ghana; and from 55.8% to 77.2% (increased by 38%) in South Africa (with both ownership and use, as might be expected, more heavily concentrated in urban areas in all countries, in both survey periods). Gender patterns in 2013/14 (Table 1) indicate lower ownership and use among girls at country level in Ghana and Malawi, but very similar levels for both genders in South Africaⁱⁱⁱ.

TABLE 1

Available evidence of positive educational value from mobile phones in the research sites

Positive educational value associated with mobile phone use might be expected in areas such as accessing information directly relevant to the curriculum (especially in contexts where text books and PCs are sparse), other wider e-learning possibilities, and more broadly for exploring personal identity and potential (all of which aspects are likely to benefit from

internet access). Responses to a general question in the survey about the positive impact of mobile phones on schooling look moderately encouraging, at least in South Africa and, to a lesser extent, urban areas of Ghana and Malawi (table 2).

TABLE 2

However, when we asked more detailed questions, including specifically whether pupils had used a cell-phone *to access information or other help with schoolwork* in the past week, positive responses were low in Ghana and Malawi (just 16.3% and 11.6% respectively overall); though a very substantial 49.7% was recorded overall in South Africa. Our qualitative research uncovered few specific, targeted information searches by students (or teachers), except in South Africa. Responses to questions about internet use (all from peri-urban or urban sites) tended to be very general, with little reference to specific websites, even with prompting, as the following comments from Ghana illustrate: *Anytime I have a homework which seems too difficult, I just pick my phone and go onto the internet to find the information* (boy 18y, Urban); *Some time ago we were taught reproduction in class but I didn't understand it well so I used the internet to learn more* (girl 16y, Urban); *I used the net to find answers to my science assignment* (boy 17y, Peri-Urban). It is unclear how helpful such sites really are, if pupils lack instructions on how to check sources for reliability.

In our South African urban and peri-urban sites there is better evidence of directed searches and some knowledge of useful websites for specific information: *On Master Maths^{iv} you are able to request an answer for any mathematics related question then they give you the answers and ...you are also able to test yourself... last week when I was stuck with a Maths project then I simply used my phone to get the answers* (girl 16y, Peri-Urban).

In facebook there are sites that are academic related such as a physical science site called Master Physics .. and you can share the notes... I was on Google three weeks back. I was given an essay.. about polygamy and I used my cellphone to get the information and I managed to get 80% pass on it (girl 18y, Urban).

This reflects the fact that a substantial portion of the mobile-learning initiatives in sub-Saharan Africa have taken place in South Africa (UNESCO 2012c:14). Mostly, as the quotation above and the following suggest, however, information is simply found through a Google search; for example, information on atomic numbers and *calculating valence electron* (boy 17y, Peri-Urban), *planets* (girl 18y, Rural), *true bearing and magnetic declination* (girl

18y, Peri-Urban); *totalitarian states* (girl 17y, Peri-Urban). This latter informant noted further: *The teachers go Google and they are cool with us Googling.*

In all three countries, teachers also occasionally reported using their mobile phones to assist with teaching or access teaching material: *I try to get current issues for illustration in class* (Ghana male secondary school teacher, Urban); *I am still using the Blackberry to help the current grade 12 students of my former school on weekends* (South Africa male 20y, university student Urban); *Sometimes when I teach social studies I use my phone in class as a teaching and learning aid. Most of the learners in standard 7 don't know how a cellphone can be used. I allow them to handle my phone and I show how it works...I was teaching about different dances so we used (the) phone to switch on the music ... to show the class different dance styles* (Malawi woman primary teacher, Peri-Urban).

Overall, however, the mobile phone seems often to play a more mundane role in the promotion of education: in particular, there were many calls between pupils to clarify about homework, between pupils and education staff regarding examination results, and an enormous quantity of calls from pupils requesting resources seemingly essential for their participation in education, such as money for school fees, books, uniform and so on. In the survey, of those currently enrolled full-time in school or college, 37.5% of respondents in Ghana, 36.9% in Malawi and 60.9% in South Africa reported using a mobile phone to ask someone for money for school/college fees or associated expenses such as uniform, books, lunch money etc. in the previous 12 months. The phone was also utilised as a calculator by many pupils, whether at school or for homework, and sometimes also for light in locations without electricity.

Data indicating positive specific *direct* educational value of phone usage is thus relatively sparse. This is partially a reflection of pupils' limited access to smart phones and associated internet access, but also, to some extent, reflects many pupils' priority usage of smart phones for non-educational purposes (social networking), and the lack of well-publicised information regarding key relevant internet sites and their value. While, as Sey and Ortoleva (2014) emphasise, recreational phone use can promote personal development and adaptation to social and technological change, both teachers and pupils with internet access could benefit from directed advice regarding potentially valuable sites, especially where this can be linked to the national curriculum, as with South Africa's MoMath and M4Girls^v.

Negative impacts of phone usage in the research sites

Much information we obtained from pupils and teachers concerns the down-side of mobile phone use, which is becoming increasingly apparent. Table 3 indicates that pupils were negatively affected in all settlement types, albeit with impact highest in peri-urban or urban locations (where phone ownership levels are also high).

TABLE 3

Negative impacts included academic performance affected by disrupted classes, due not only to pupil practice, but also to teachers' calls; disruptions in adolescent sleep patterns associated with cheap night calls; time lost through prolonged sessions on social network sites; harassment and bullying; and increasingly widespread access to pornography. With the exception of pornography (see below) this is reported in both survey and qualitative data.

Class disruption from pupils' phones

Of those enrolled pupils reporting negative impacts of mobile phones on their schoolwork in the last 12 months, 13.0% in Ghana, 42.1% in Malawi and 69.6% in South Africa said this included disruption by their own or by other pupils' phones. Class disruption associated with phone use at one time principally involved phones ringing out, as in the following examples from Malawi: (my friend's phone) *even disturbed him and the whole class when it rang. That drew punishments onto him.... Punishments take place while classes are in progress (so you).. miss out and lag behind* (boy 17y, Peri-Urban); *I enjoyed going outside classes to answer calls because I knew that my fellow students were admiring me because of cell-phone* (girl 18y, Peri-Urban).

Increasingly, however, school bans are forcing pupils to be less blatant in their phone use. Pupils with basic phones still report many cases where they or their friends had purportedly left the class to go on an errand or to the lavatory, when they want to answer a call, but with smart phone proliferation in urban areas, the potential for sustained personal learning disruption has escalated: *At times you find that you are in class but friends are busy sending you messages on WhatsApp and you are not concentrating* (South Africa girl 16y, Peri-Urban); *Instead of listening to what the teacher was teaching in class, I was busy on facebook chatting with friends* (Malawi girl 18y, Peri-Urban); *he is always on MXit* (South Africa boy 14y, Peri-Urban, explaining his friend's poor performance).

Class disruption from teachers' phones

In the survey we asked school pupils about their teachers' use of phones **in school** in the week preceding the survey: even if not all pupils answered truthfully (given the rare opportunity this offered to comment on the behaviour of people with power over them), the responses tabulated below give some indication of the likely prevalence of these practices: in Malawi nearly 60% of enrolled pupils reported their teachers using a phone in lesson time, in Ghana well over 60%, in South Africa a massive 90%. It is unlikely that a majority of these calls were directly relevant to their professional practice (as qualitative data, discussed below, indicates). Even if focused on professional issues, it is uncertain that those conversations were essential during lesson time.

TABLE 4

Observations of class disruption caused by teachers' phones came not only from pupils in all 24 sites, but from teachers themselves. Some teachers always go outside the classroom to take or make calls, as was the case with the Malawian primary school teacher who said he regularly receives calls in class from relatives and other teachers - he puts the phone on silent and, if the call is important, goes outside to answer it, *even though it is disturbing to learners. They understand*. Meanwhile, students may play havoc indoors, so that, unsurprisingly, students and teachers frequently say that they lose track of the lesson: (our maths teacher's) *phone rang ... she came back and said she'd forgotten what she was saying so we must remind her...the call disturbed everything... she had to start at the beginning and ...she could not finish the class* (South Africa boy 20y, Urban).

Other teachers simply tell the class to be quiet, and take calls in the classroom. One young woman teacher in Ghana, for instance, explained how she leaves her phone on her desk – if it vibrates, the children see it and bring it to her at the board! The following excerpts further illustrate the type of issues which can arise: *my phone rang and because my caller tune was one of the latest hip life songs, 'Walahi', all the students started to sing... and for 15 minutes the class was out of control* (Ghana male 25y junior high teacher, Peri-Urban); *Phone interruptions in class mean that you can forget what you are going to deliver... my business customers forget (I'm teaching and) call me anytime* (Malawi woman secondary school

teacher, also running a chicken business, Urban). Given their relatively low pay, many teachers in Malawi (and Ghana) have parallel businesses.

Time on social network sites

Concern about the time that young people spend on the internet and risks of addictive behaviour is growing worldwide (e.g. Yu et al. 2013). Pupil time spent on social network sites, both inside and outside school, is a frequent concern among teachers in our urban and peri-urban sites: the lament from a Malawian urban schoolteacher that, *They are always on social networks... they don't concentrate*, is a common one.

In the survey, only 75 (out of 1033) enrolled pupils in Ghana and 75 (out of 941 enrolled pupils) in Malawi, said they had spent time on social network sites in the previous four weeks. Of those, 9.4% (just 7) in Ghana and 12% (just 9) in Malawi said they had spent two hours or more, the last time they had been on a social network site. In South Africa, however, 415 (out of 1201) enrolled pupils had been on social network sites in the previous four weeks and 20.4% said they had spent two hours or more (including 8.4% [35 pupils] who had spent four hours or more) the last time they used a site^{vi}. While these figures look relatively modest overall, for those who spend four or more hours on a site, concerns around 'addiction' arise.

In South Africa many pupils seem to recognise that lengthy interactions on these sites can be harmful, yet some still find the activity compulsive: *We spend our crucial time in MXit instead of doing our homework. I am unable to control myself and refrain from social networks* (boy 17y, Urban); *I hate MXit now but won't stop using it.* (boy 15y, Peri-Urban); *I failed grade 11 because of the cell-phone...I was just taking my books and put them next to me... I would be playing face book...* (girl 18y, Urban); *I usually spend four hours on MXit in three times a week... I used to study hard but now I am lazy and the passing rate has fallen* (South Africa girl 17y, Peri-Urban). Of course, teachers too may become caught up by this fascination: as one 10 year old boy observed, *my teacher likes social networks... we hardly get her attention, even if we want to ask permission to go to the toilet, because she pays more attention to her cell phone* (South Africa, Peri-Urban).

New temporal rhythms associated with cheap night call rates

Cheap night call rates, meanwhile, also appear to contribute to reductions in concentration in class, as a result of disrupted sleep patterns, with potentially wider impacts on adolescent physical and emotional health (Valkenburg and Peter 2011; Vallee et al. 2013). Although cheap/free deals vary between countries and network providers, there is evidence in all countries of negative educational impacts. In our survey only 11.2% of enrolled young people in Ghana said they had had their sleep disrupted by cell phone use, but 27.2% in Malawi and 57.5% in South Africa were affected: it was considered a significant problem by just 1.4% in Ghana and 8.2% in Malawi, but by 30% in South Africa.

The problem also emerged in in-depth interviews, in some cases associated with subsequent withdrawal from education due, at least in part, to poor performance: *instead of studying I was making free night calls* (Ghana girl 18y school drop-out, Urban); *I used to call at night because of 'mtolo' (cheap calls) which start at 9pm to 7am.... I was staying up all night calling and texting friends* (Malawi girl 19y, Urban); *With 100% [free] people call you at night and sleep around 2am ...and during the class you fall asleep* (South Africa girl 17y, Rural); *I used to make an alarm to wake up at 12am so that I ... call my friend using Vodacom night shift calls. I would struggle to wake up in the morning* (South Africa girl 18y, Urban). Given pupils' limited resources, the temptation offered by these network promotions is substantial. In other cases, it was home co-inhabitants whose noisy phone discussions kept pupils awake at night.

Bullying/harassment

Direct physical violence and harassment is common in many African school contexts (e.g. Leach 2006, Burton and Leoschut 2013). However, online bullying and harassment is now also occurring, most commonly through mobile phones, a point well illustrated by two recent Africa-focused studies of children and ICT. A qualitative study in Kenya of 152 children aged 12-17 years finds many reports of hurtful messages - but young people view these as inevitable, not serious, and the messages are simply deleted (UNICEF/Intermedia 2013: 3). The South Africa study (Burton and Mutongwizo 2009), conducted among 1,726 young people aged 12 to 24 years (approximately half of whom were black) in four cities, reported that a quarter of these had experienced some form of bullying or aggression via cell-phone in the previous 12 months (highest among black youths; only slightly more prevalent among girls than boys), much of it anonymous. A UNICEF (2011) survey of 25,876 people (91% aged under 25) in South Africa on the free social networking platform MXit (which is

favoured by teenagers), focused around a small number of topics found, very similarly, that 26% had experienced insults on MXit. Burton (2014) observes that there has been little coordinated, formalized response to child online protection either by industry or state in South Africa, though the country supports international initiatives such as ITU's Child Online Protection Initiative and NGOs such as Childline have online and mobile counselling services.

We asked young people who had used a phone in the last 12 months whether they had ever experienced unwanted, unpleasant or upsetting calls or texts: among enrolled pupils this was the case for 16.3% in Ghana, 27.6% in Malawi and 55% in South Africa; 2.8% in Ghana 6.6% in Malawi and 16.5% in South Africa indicated this was a substantial problem. This suggests possibly even higher levels of cyber-bullying in South Africa than reported by Burton and Mutongwizo (2009; and similarly little gender difference) and in UNICEF's MXit survey^{vii}.

In our qualitative interviews, reports of bullying and harassment among school pupils (within and outside educational contexts) often related to girl pupils being pestered by schoolboys or older men, including teachers. The following is typical: *David continues to send me love texts. This week up to now he has sent about six .. he is disturbing me.. I think he wants something more than friendship which I cannot do. My education is very important to me... no matter what I do he will not stop* (Ghana girl 16y, Peri-Urban). However, the same boy also sends her money for airtime (a pervasive element of girl/boyfriend phone-related etiquette in Ghana), which she accepts! There was also evidence of unwelcome pornographic pictures circulating, name calling and cruel gossip, the latter often in anonymous calls between protagonists of the same gender: *She told me that I think I'm the best learner. She called me names...She accused me of stealing her boyfriend. I told her that if she doesn't stop calling me I will go to the traditional healer, so that I can get something that is going to take her voice. She stopped calling me because she believed that I was going to do that, but I was joking* (South Africa girl 18y, Rural). Many respondents, however, appear to suffer such virtual attacks with no attempt at retaliation. Of particular concern is the access of (male) teachers to (girl) pupils' cell phone numbers: *Sometimes they (teachers) call you and tell you that you are pretty and cute, and they the teacher would ask to touch the learner's private parts* (South Africa girl 17y, Peri-Urban).

Pornography

Recent reportage suggests sexually explicit content on young people's mobile phones is now widespread in Africa and Asia (e.g. Cook et al. 2012; UNICEF 2013; Bose and Coccaro 2013): a similar picture emerged in our research sites from qualitative research. (We did not include a specific question on pornography in the survey, following some debate among the research team about its advisability). The distribution and viewing of pornography is widely reported by pupils (including those at upper primary-level) across our research sites (rural as well as urban, since pornographic pictures and videos can be downloaded onto basic phones). Older boys are particularly likely to report their active use of pornography: *I used to use my phone to show porn videos to my colleagues. At times the whole class, both males and females will watch... I know some teachers watch....* (Ghana boy 17y senior high, Urban); *Usually I go to see some (sites with porn) and recommend it to my friends...it is like a competition... (we) see who brought on board the most serious nude pictures especially of football players. .. We hide them in folders (so) people can go through our phones and will never discover it* (Ghana boy 17y, Peri-Urban); *Some watch things that are beyond their ages; these things are pornographic films or videos* (Malawi boy 14y, Rural). Girls were less likely to refer to pornography, and were often uncomfortable when the issue was raised: *Some of my friends on MXit tend to send me nasty pictures like porns. I just laugh, but sometimes I do realise that is wrong.... It is boys who usually do this* (South Africa girl 17y, Peri-Urban).

Of particular concern are the occasional reports we received from pupils and teachers of sexting (sending and receiving sexually explicit photographs/messages via cell phone), including among primary-level pupils in Ghana and South Africa. Strassberg et al. (2014) argue (in a US high school context, where this is common), that while it is unlikely that treating those who send or receive such messages as sex offenders, we need to understand sexting among teens more fully, if we are to 'know how, or even if, we should respond' (p.182). In South Africa there are official police reporting procedures that make this a sensitive issue (Badenhorst 2011).

Wasted money?

The financial burden of phone use (handset, airtime, etc.) encourages many pupils to sacrifice food, books and, in some cases, their bodies. Of those (1,037) school-enrolled youth in the survey who said they had purchased phone credit (airtime) in the previous week,

approximately half felt they had sacrificed important items in order to do so (50.7% in Ghana, 48.8% in Malawi, 51.3% in South Africa): the dominant reported sacrifice in Ghana was food, followed by school books; in Malawi and South Africa it was school lunch, then food. This is not, of course, necessarily wasted money, but widespread phone theft (including at school), the prevalence of network promotions which encourage young people into intensive phone use, and numerous scams, all contribute to a loss of (scarce) resources.

Young people often divert funds provided by parents and carers from the purpose for which they are intended into buying phones and airtime, as in the following illustrations from South Africa: *My parents usually give me 10R to buy lunch but I usually forgo that and buy airtime...* (girl 17y, Peri-Urban); in some cases the diversion was substantial: *..last year I was doing a finishing at St John's college... but since I did not have a cell phone I lied to my family that they want R1500 for registration ...I used it to buy myself a mobile phone - Nokia C3 with internet (Prompt: Didn't your parents request proof of payment?) They did but I cheated on them, like I told a certain guy from my street that I have such a problem but, lucky me, the guy had a receipt book with him so I just faked the proof* (woman, 23y). The pressure in school to own a smart phone is very considerable: *I feel I am missing out a lot. In my class people forward each other jokes and pictures on Whatsapp and BBM.....it hurts me* (girl 16 y, Urban). We were told that school girls often date taxi-drivers because they can afford to buy phones and airtime, but that such gifts are often made specifically in anticipation of sexual favours (XXX 2010).

Policy and policy engagement

Our findings indicate the nature and scale of problems associated with mobile phone use in educational contexts. But how, and to what extent, should and can public policy address these issues? This final section considers current policy in our study countries and the potential to address some of the most negative aspects of phone use and promote more positive usage among young people through ongoing engagement with policy makers.

Current policy on phone usage in educational contexts in the study countries

Teacher use of mobile phones in class has prompted debate worldwide (e.g. Koebler 2011; Mumsnet Talk 2014). There was a small amount of evidence of positive use by teachers in school in our study sites, as noted earlier, but the majority was negative. Moreover, it is extremely difficult to monitor professional versus non-professional usage in class. Many

head-teachers in our study sites say they would welcome clear policy direction: it is difficult for them to impose regulations on teachers' class use without government support. Given the level of teacher use reported in our pupil survey, and the implications this has for pupil perceptions of the fairness of pupil bans, it would seem that a ban on phone use for teachers (as well as pupils) during class time, as already prevails in many countries, may be appropriate, unless or until classroom e-learning is specifically supported by government. To date, this has not occurred in any of our study countries.

A related issue concerns teachers' access to pupils' phone numbers, which offers the potential for unprofessional conduct, notably when male teachers target girl pupils. In the following case, the impact has clearly been enormously damaging: *I received a call from one of my teachers to come to his house. I got to his house and he asked me to cook and wash for him. I did all that with good intentions. ... but before I could realize, he had raped me* (Ghana girl 18y, Urban). Such cases arguably offer sufficient reason for schools to require all teachers' phone interactions with pupils to pass through formal channels such as the school office.

So far as *pupil* use of phones in school is concerned, individual school bans are common across all three countries, often as a response to problems of theft and concerns about class disruption. In our survey, we asked enrolled pupils whether they were allowed to take phones into school: 94.7% in Ghana, 85.9% in Malawi and 85.3% in South Africa said they were not. Despite reported bans, 7.5% of pupils in Ghana, 13% in Malawi, and a very substantial 41% in South Africa, said that they had taken their phone into school in the week prior to the survey. It is clear that outright defiance of bans is not uncommon: *nowadays with free rights they do bring* (Malawi urban secondary school teacher Urban); (despite the ban) *some pupils put on earphones and dance when you are teaching* (South Africa rural secondary school teacher). The high incidence of phone usage in class among teachers must inevitably encourage pupil resistance. Reports of unannounced swoops and confiscations of pupil phones are numerous, especially in South Africa, and parents are often brought into school to aid resolution: *If you're caught with a cellphone in class....you are called to a disciplinary committee with your parent, then punished - girls may be told to clean the principal's office in break time and males to clear the staff loo - then they return the cell phone (only) when schools are closed* (South Africa girl 16y, Peri-Urban). In urban Ghana we heard of pupils' phones being smashed or burnt in front of them, if they were caught with a phone more than once. But such intervention also brings frequent arguments between school staff and parents/carers who say they need to be able to contact their children at short

notice and have often actually purchased phones for their children (especially secondary school boarders): *we fight with the parents because they say you don't own that type of cell phone (and have taken it because you are jealous)* (South Africa rural secondary school teacher).

Overall, there appears to be an absence of national policies to promote responsible phone use either by pupils or teachers. Even in South Africa, where mobile phone ownership is highest, it is left up to provinces to put “guidelines” together for their schools and the school governing bodies themselves then set specific rules and regulations. On reflection, even if national policies are set, the question of how to enforce them at school level remains (as the lack of enforcement of national legislation banning corporal punishment in many countries suggests).

Moving forward: promoting responsible phone use in schools

Widespread, wide-ranging sensitisation to the importance of responsible phone use is clearly needed, not only among pupils, but also among teachers and parents, in all three countries. Specific pupil guidance about responsible phone use in the school curriculum could be an important first step. The remark by a Life Skills teacher in a Malawi urban secondary school that, *there is no teaching (about cellphones) in the syllabus ... we just mention it here and there in class*, is typical of responses from teachers on this theme. In their five-country African study of children's use of ICT, Bose and Coccaro (2013, p.16) found that ‘only 30%’ of children surveyed received any kind of guidance on safe internet use at school: it is far rarer in our study sites. Careful presentation of important information on security, rights and phone etiquette within Life Skills, or other appropriate courses, would be extremely valuable. This might cover the risks of inputting potentially sensitive information into social network sites; cyber-bullying; potential scams; balancing time on social network sites with schoolwork demands; implications of excessive usage in the night; and suchlike.

There is also an argument in favour of promoting responsible phone usage inside the classroom, as well as outside (i.e. as opposed to focusing purely on bans), especially in contexts where PC ownership is likely to remain low for some time, given the potential role of mobile phones in e-Education. There have been various e-learning initiatives in South Africa (UNESCO 2012c; Vandeyar 2013); interest in e-Education is also growing in Ghana and Malawi (Addah et al. 2012; Hollow and Masperi 2009), albeit as yet mostly pilot teacher

distance-education projects. However, the difficulty will be in ensuring a level playing field regarding equal access among pupils (UNESCO 2013).

Since personal ownership of mobile phones remains limited (and, in Ghana and Malawi, still skewed by gender), the BYOD (bring your own device) approach favoured in some high-income country contexts is not likely to be an option. Recent initiatives in South Africa to put tablets into schools for pupil use may be an appropriate way forward, especially as tablet costs reduce, but here, as elsewhere, for e-Education policy to transform into effective classroom practice will require adequate teacher training and commitment both from teachers and government (Vandeyar 2013). UNESCO (2012b), which observes the need for national policy makers to provide overarching structure and guidance, whether education is decentralised or not, reports that the MoMath project has worked well in South Africa; presumably this success is in part due to official support from the Department of Education (nationally and provincially), and the active involvement of other stakeholders including Nokia and mobile network operators. However, UNESCO also emphasises the importance of local context when creating or adapting policies and the need for flexibility given the speed of change in technological landscapes.

Developing a more focused programme of responsible phone use in education, which builds on current findings and the limited successes reported to date, will require significant buy-in from policy makers. It is thus pertinent to briefly reflect on our efforts to penetrate the complex and dynamic policy world in our study countries. We have made considerable efforts to engage face-to-face with policy makers, on the basis that our reflexive practices could enhance the potential for policy engagement. This has included interviews with key staff in government education services, and inclusion of staff from ministries of education, health, telecommunications and women/children's affairs, and network providers in our Country Consultative Groups (alongside teachers, youth and NGOs).

Overall, reaction to our emerging findings has been one of considerable concern, particularly in Ghana and Malawi, where the scale of these issues is just emerging: *It is alarming...The government has given schools leeway to ban cellphones. We are handling disciplinary cases here at my desk* (MoEST headquarters official, Malawi); *We don't have any formal guidelines for pupils or teachers so I think it's critical... as a parent as well* (another headquarters official, MoEST, Malawi); *Our children have acquired 'Mobile Phone Attention Deficiency Syndrome'* (Ghana Education Service director). However, translation of concerns

into appropriate, well-considered action that avoids moral panic will take time: there are diverse policy actors, and governments are typically multi-levelled and responsibilities diffuse.

Recent literature emphasises factors such as political context, timing, windows of opportunity and the importance of personal relationships and contacts between decision-makers and researchers in promoting positive interactions with policy makers (Jones et al. 2009; Oliver et al. 2014). These factors have been significant in our engagement, particularly with the Malawi Ministry of Education, Science and Technology, which has committed to formal partnership with the University of Malawi and planned an action research study with them. Our discussions fortuitously coincided with the formulation of Malawi's Education Sector Implementation Plan, but the death of the University of Malawi researcher who led discussions with MoEST for the research team has been a major blow^{viii}. Taking the work forward, in this case, not only depends on securing adequate external funding^{ix} but also on rebuilding our Malawi team. Regarding interactions with commercial interests, meanwhile, we have drawn the attention of network providers, at central and local levels, to issues such as the damaging impact of night call promotions on pupils' education. Some have participated in our meetings, but often distinguished there between their responses as representatives of commercial companies and their views as parents. Clearly, both in public and private sector spheres, we will need to continue regular interactions with policy makers well beyond the formal completion of our research, if our findings are to be taken forward into appropriate action.

Conclusion

We concur with Burton's (2014) argument that young people need to be empowered to build on their own agency and be supported in the development of those skills that will enable them to become competent and confident digital citizens. Our evidence of positive and negative aspects of phone use in educational contexts across Ghana, Malawi and South Africa indicates that the education sector has a critical role to play in that endeavour. The full engagement of ministries of education, schools, caregivers, communities and network providers, in addition to youth themselves, will be required for the promotion of digital education and associated safety programmes for responsible phone use. We are at a critical moment in the digital life of sub-Saharan Africa's youth: on the one hand, there is the

prospect of enormous positive advances in education and associated improvement in young people's lives and life chances; on the other, the threat of wasted opportunity and damaged lives. There is an urgent need for action.

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Table 1: Ownership and usage of mobile phones (all types) among children c.9-18y, 2013/14 (N=3085)

	Male (%)	Female (%)
Ghana: Own mobile phone	18.8	12.9
Ghana: Usage last week	45.0	37.2
Malawi: Own mobile phone	10.4	6.2
Malawi: Usage last week	36.1	33.4
South Africa: Own mobile phone	50.9	50.8
South Africa: Usage last week	77.4	77.1

Table 2: Enrolled pupils in different types of settlement ever experiencing some personal positive impact of cell phone use [by self or others] towards doing well at school

	Remote Rural (%)	Rural with services (%)	Peri-Urban (%)	Urban (%)	Country total (%)
Ghana [N=707]	16.9	21.4	33.2	36.1	27.7
Malawi [N=501]	8.5	8.8	22.1	32.0	21.6
South Africa [N=1026]	64.1	75.8	72.5	71.9	71.3

Note: Impact X Settlement Type: $P(x^2) \leq 0.005$ for Ghana and Malawi. Not significant for South Africa.

Table 3: Enrolled pupils in different types of settlement ever experiencing negative impacts of cell phone use [by self or others] on schoolwork/homework

	Remote Rural (%)	Rural with services (%)	Peri-Urban (%)	Urban (%)	Country total (%)
Ghana [N=710]	18.4	24.7	21.9	29.7	24.1
Malawi [N=500]	22.5	23.8	52.3	53.7	42.4
South Africa [N=1031]	65.9	55.9	62.0	60.9	61.0

Note: Impact X Settlement Type: $P(x^2) \leq 0.005$ for Malawi. Not significant for Ghana or South Africa.

Table 4: Pupil observation of teachers' phone use in school

	Malawi (N=936)	Ghana (N=1028)	South Africa (N=1186)
Not observed (%)	23.8	20.0	6.3
Teachers used phones but not in lesson time (%)	15.8	13.6	5.5
Teachers <i>stepped outside</i> classroom to use phones during lesson time (%)	34.7	46.6	44.3
Teachers used phones <i>in classroom during lesson time (%)</i>	25.6	19.7	43.9

Note: Teacher usage \times Country: $P(x^2) \leq 0.005$

ⁱ Unicef's Kenya study suggests parents often focus on negative aspects of phones because of limited understanding of their educational value, but in our study countries many parents reportedly buy phones for their children, including to help them study.

ⁱⁱ Forest zone and coastal zone in Ghana, Blantyre [southern highlands] and Lilongwe [central plains] districts in Malawi, Eastern Cape and Gauteng/NorthWest Provinces in South Africa.

ⁱⁱⁱ We do not focus on gender differences due to word-length constraints.

^{iv} Master Maths is a fee-paying programme offering extra maths help for grades 4-12 pupils.

^v MoMath, hosted by MXit is aligned with the national maths curriculum. M4Girls was a pilot project targeting girl grade 10 pupils in underserved communities.

^{vi} Not dissimilar to the study of nearly 1,600 pupils in Nelson Mandela Bay (UNICEF 2012 p.20), where 5.8% spent over 4 hours per day online.

^{vii} Our South Africa survey, unlike that of Burton and Mutongwizo, is limited to poor settlements: it includes none who are white or of Indian/Asian origin (compared to 19% white and 7% Indian/Asian in their study).

^{viii} We include the researcher among authors in this paper: his death in a road accident has been a major blow to the research team.

^{ix} We are particularly aware of this issue, having encountered problems around the lack of resources to support research uptake in our interactions with the Ghana Education Service in a previous study.