

Debunking the 'digital native': beyond digital apartheid, towards digital democracy

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Abstract

This paper interrogates the currently pervasive discourse of the 'net generation' finding the concept of the 'digital native' especially problematic, both empirically and conceptually. We draw on a research project of South African higher education students' access to and use of Information and Communication Technologies (ICTs) to show that age is not a determining factor in students' digital lives; rather, their familiarity and experience using ICTs is more relevant. We also demonstrate that the notion of a generation of 'digital natives' is inaccurate: those with such attributes are effectively a digital elite. Instead of a new net generation growing up to replace an older analogue generation, there is a deepening digital divide in South Africa characterized not by age but by access and opportunity; indeed, digital apartheid is alive and well. We suggest that the possibility for digital democracy does exist in the form of a mobile society which is not age specific, and which is ubiquitous. Finally, we propose redefining the concepts 'digital', 'net', 'native', and 'generation' in favour of reclaiming the term 'digitizen'.

Keywords

cell-phone, critique, 'digital native', discourse.

Introduction

The research literature has spawned a great deal of discussion about the age or generational aspects of young people today, with the dominant labels being used to categorize the present generation of students including Net Generation (Tapscott 1997; Oblinger & Oblinger 2005; Perillo 2007), 'digital natives' (Prensky 2001a,b), Generation Y (Perillo 2007), Millennials (Howe & Strauss 2000) and Generation C (Duncan-Howell & Lee 2007).

When Don Tapscott (Tapscott 1997), originally coined the phrase Net Generation in 1996, while provocative he was not rigid in his use of the term defining the group quite broadly in terms of age, generation profile, and how new digital behaviours would impact on various aspects of life. The later term 'digital native'

followed, originally coined by Prensky to refer quite specifically to young people who have grown up with digital technology and particularly being used to describe a supposedly new kind of student entering higher education (Prensky 2001a,b).

A serious problem with the idea of the 'digital native' is that it is an 'othering' concept. It sets up a binary opposition between those who are 'natives' and those who are not, the so-called 'digital immigrants'. This polarization makes the concept less flexible and more determinist in that it implies that if a person falls into one category, they cannot exhibit characteristics of the other category.

Whatever the terminology, the argument is that students today enter higher education having been exposed to a wide range of digital technologies which did not previously exist, which is, of course, accurate. The leap is then made that students are therefore all technically proficient using a range of these technologies, and that 'they do things differently'. (Prensky 2001a,b) As a result, the implication is that higher education practices

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need to change in response to the needs and competencies of these incoming students. Learning environments should accommodate these 'more technology-driven, spontaneous, and multi-sensory' youngsters (Prensky 2001a,b; McCrindle 2006).

Within higher education internationally, it has been noted that these concepts have been widely adopted with little critical reflection (Bennett *et al.* 2008; Bullen *et al.* 2008). Within South Africa, the notion of the 'net-generation' has also received exposure in the media as South Africans try to understand the technological habits of children (Clay 2008), readers (McLeod 2007), and citizens (Pandor 2008). Research on university students as the 'net-generation' has been foregrounded in recent local conference programmes such as *e/merge 2008* (Halse & Mallinson 2008), the First South African Conference on the First Year Experience (Broere & Kruger 2008) as well as a specific stream on educating the digital native at the national higher education conference hosted by the Higher Education Learning and Teaching Association of South Africa (HELTASA 2007).

The study and context

Method

Our observations in this paper are based on an ongoing 6-year research project into South African university students' access to and use of ICTs. This research has enabled us to explore the range of issues students face in terms of access to physical, personal, social, and digital resources which enable them to use Information and Communication Technologies (ICTs) (Czerniewicz & Brown 2005a) and particularly how students use ICT for learning (Czerniewicz & Brown 2005b; Brown & Czerniewicz 2008).

The project has consisted of three phases. The first phase comprised a survey conducted in 2004 among 6513 students from six universities in one South African province.¹ The research was then expanded to four more provinces;² this second phase in 2007 surveyed 3506 students from a further six universities. The surveys comprised 100 questions in three parts, access to ICTs (47 questions), use of ICTs for learning (41 questions), and demographic details (12 questions).³

Phase 3 in 2009 adopted a nested case study approach (Lieberman 2005) involving a short survey of 513 students identified as types through the previous phases

across six universities. These provided the basis for 100 first-level telephone interviews and 38 second-level interviews, and culminated in six focus groups.

In this paper, we draw primarily on data from the Phase 2 survey regarding when students first started using computers, how or where they learnt to use computers, how they currently solve computer-related problems, their type of off-campus access to ICTs, their reported self-efficacy as well as their demographic information, and use of cellphones for learning. The data reported on is from Phase 2 unless otherwise stated.

Using a mixed-method approach (Creswell 1994), the project's need was to collect baseline information across a wide group as well as to move beyond fact gathering to a multi-layered understanding of the issues of access and use for students in higher education. The statistical analysis is descriptive, using the data to contextualize and understand various perspectives as the survey has largely focused on experiences and perceptions. Like others (Creswell 1994; Roberts 2002; Bjoern 2005), we argue that the interpretive approach in which we operate allows for both quantitative and qualitative data.⁴

In terms of how representative the 2007 sample was of the national population of higher education students, they comprised slightly more undergraduates (89% in the sample compared to 85% in the population), the same gender mix (55% females) and slightly more international students (10%).⁵ As the sample was drawn from only four of South Africa's nine provinces, the home language mix of sample was not reflective of the national higher education population and was dominated by Afrikaans (23%), isiXhosa (20%), English (15%), seSotho (14%), and seTswana (12%).

Context

The study has been taking place in a local context which both echoes and distinguishes itself from universities globally. Like universities worldwide, South African higher education institutions are facing increasing massification, with both more students entering higher education (enrolments increased by 25% between 1995 and 2007) and increased diversity. The increase (22%) in Black African students since 1993 is especially high and due to substantial changes in the sector since the end of apartheid in 1994. Gender is evenly balanced within the sector with only marginally higher male participation in

higher education compared to female (53% male) (HEMIS 2004).

Despite challenging and resource-constrained conditions, there are indications that South African universities are investing substantially in ICT infrastructure, either with their own resources or with the assistance of grant-giving organizations. In the light of such investment, knowledge of actual use, especially for educational rather than administrative purposes, is essential. Very little such research is taking place, and none is being funded by the state, or the sector itself, as is the case in other countries.

Debunking the 'digital native'

The 'digital native' is problematic as a concept and likely to be offensive as a term.

One criticism to be levelled relates to labelling itself. Helsper, for example warns that continued use of terminology such as 'digital native', as well as the ideas associated with it, could have unexpected consequences for young people in terms of how they do (or do not) manage negative and risky online situations (Helsper 2008b).

Labelling is indeed problematic and this label particularly so, an aspect that only a handful of researchers have remarked on. We agree with the argument that deconstructs the discourses of the terminology as it might appear to teachers and students, with all its negative connotations. Bayne and Ross suggest that the terms construct the 'native' as the future and in the commanding position while the 'immigrant' is constructed as the old, the past and obsolete (Bayne & Ross 2007). They go on to explain that such language 'inevitably evokes complexities and anxieties around migration, integration, and racial and cultural difference in Western society'.

However, in our South African context (and presumably previously colonized countries), 'native' is synonymous with colonialism, apartheid, and domination and does not connote images of superiority and the future. In this situation, it was the natives who were constructed as backward and the 'settlers' who brought civilization. The irony of this has not been lost on all, as Song (Song 2008) comments that it makes him 'think about how 'digital natives' are being marginalized in Africa'. Indeed, we could adopt a cynical perspective that this westernized digital realm is yet another colonizing

attempt to force western norms, beliefs, attitudes, and cultural values on the 'natives' in an attempt to get 'them' speaking 'our' language and thinking the way 'we' do.

These observations are especially pertinent given that Prensky is not satisfied with these metaphors of colonialism and has now created an evolutionary metaphor, *homo sapien digitalensis*, which reinforces the linear modernist connotations of backwardness and progress. Thus *homo sapien digitalensis* is imbued with 'digital wisdom' given, he argues, that digital technology can make humans not just smarter but truly wiser (Prensky 2009). These evolutionary connotations of natural selection and extinction imply betterment, advancement, advantage, and opportunities for the future for those who are evolved, and the opposite for those who have not suitably progressed.

The implications that people are born into something that determines them and which they cannot change is problematic. Also, problematic is the implied power relations and superiority attached to those with particular sets of skills and dispositions. The positioning of some students as being better than others evokes a digital digerati – a cyber elite (Levine 1999).

The concept is not empirically supported

In addition to these ethical and conceptual problems, the concepts and claims about 'digital natives' and the net generation have also been empirically challenged. Indeed, McKenzie argues that the application of concepts such as neuropsychology which underpin the argument for the 'digital native' is flawed (2007). At the same time, Bullen *et al.* (2008) and others argue that there is insufficient empirical evidence to support the concept. Others contend that while there might be differences between younger and older generation in terms of their use of technology, there is as much variation in skill within the 'digital native generation' (Kennedy *et al.* 2006; Bennett *et al.* 2008) as between generations.

In our own work, the concept does not stand the scrutiny of the data itself.

Not about age, experience more important

Age is supposedly a determining feature of the concept of the 'digital native' in the net generation. However age is not a determining factor in our study in the South African context.

Age	HEMIS 2002 total (n)	%	Survey 2007 total (n)	%
<22 years	252 837	54	1804	65
23–25 years	74 080	16	752	27
26–29 years	19 690	4	108	4
30–34 years	42 818	9	49	2
35 plus	80 723	17	53	2
TOTAL	470 148		2766	

Table 1. Age profile of South African university students: a comparison of HEMIS 2002 data and the survey data.

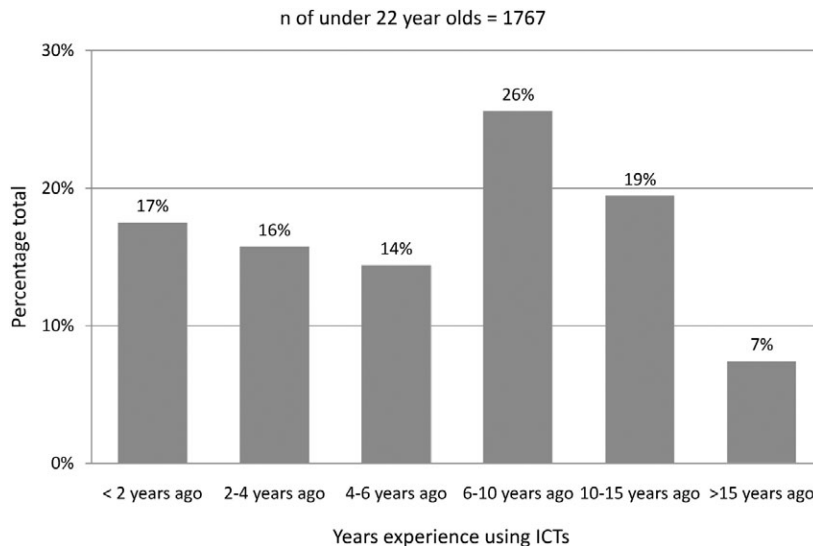


Fig 1 Years of experience using ICTs for students under 22 years of age.

We explored the age profile of our students to see how it relates to their access to and use of ICTs in order to separate out the issues of age and digital practices. Using the commonly applied chronological scheme pertaining to the millennial generation as being born between 1982 and 2000 (Howe & Strauss 2000; Reeves 2008), we examined the generation of university students born since 1982. While South African universities are dominated by the millennials with 54% of students being under 22 years old (See Table 1, drawn from the most recently available data on age from the Higher Education Management and Information System – HEMIS – for contact institutions), students' enrolment spans a range of age groupings including a significant proportion of students from the previous generational cohort, so called Generation X, born between 1961 and 1981.

This is in accord with other international higher education contexts where 'mature age' students also comprise a notable portion of the higher education sector.

Figure 1 depicts a subset of students from the 'millennial generational grouping', and reveals that half (52% $n = 926$) of this group of students have more than 6 years experience using computers. Only 26% of the students might be described as having 'grown up digital' as indicated by having used a computer at least since they were 12 years old and having more than 10 years experience. In contrast, 33% of students within this group have fewer than 4 years of experience using ICTs, with a subset of 17% of students having fewer than 2 years experience.

These findings demonstrate that within South African higher education, students born into the millennial generation cannot be assumed to have grown up digital, nor can homogeneity be assumed in terms of computer experience. Rather, it is evident that the range of skills and experience of the students within 'the millennial generation' is diverse.

In addition, an examination of the range of experience across the age groupings (Fig 2) shows that within each grouping there are students with low, medium, and

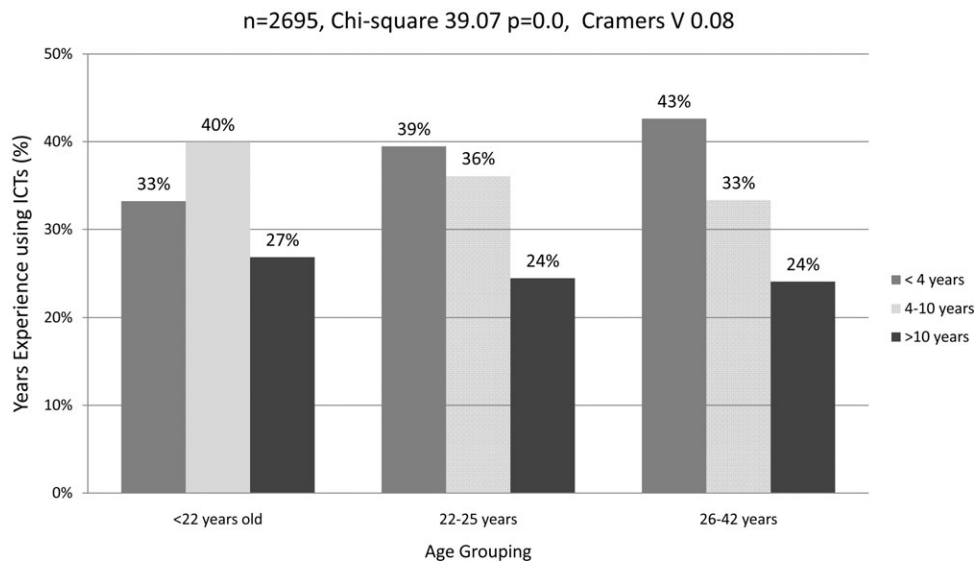


Fig 2 Range of years of experience using ICTs across all age groupings.

high levels of experience. Also, a similar percentage of students in the older age grouping (26–42 years) has more than 10 years experience using ICTs when compared to the younger age grouping (<22 years old). While this might have been acquired at a different stage in their lives (and could account for differences in cultural values) (Rettie 2002), it does not provide evidence for younger students being more digitally experienced than their older counterparts. In addition, while the relationship is statistically significant given the large sample size, its effect (Cramer's V of 0.08) demonstrates a negligible association between age and experience (Kotrlík & Williams 2003).

These findings concur with research internationally over the past few years which have considered whether or not one can associate particular characteristics with 'the millennial generation'. Empirical evidence refuting the homogeneity of this grouping is confirmed in other contexts such as Canada (Bullen *et al.* 2008), the United Kingdom (Margaryan & Littlejohn 2008), New Zealand (Sherry & Fielden 2005), and Australia (Kennedy *et al.* 2006).

Not a generation, but an elite

The claim is that students of a whole generation are 'digital natives'. We found that only a small percentage of students met the criteria of the 'digital native' as defined by Prensky: a person from the millennial generation; one who has grown up with digital technology;

one who comes to university familiar with computers; and one who is purported to learn to use computers informally – either teaching themselves or through social networks such as family and friends – rather than needing to be taught.

The specific survey questions from which we draw the data are provided in Table 2.

We therefore linked our data to Prensky's criteria by considering students who were younger than 22 years old in 2007 (i.e. born after 1982), had more than 10 years experience using a computer, indicated they had learnt to use a computer by teaching themselves or through social networks (family and friends), and who reported being able to solve ICT problems themselves or by drawing on supportive social networks (Table 3).

We found that these criteria applied to only to a small percentage – 12% – (331) of our students.

Interestingly, if one ignores the age factor, there is an additional small group of students (157 individuals, 4% of the sample), who exhibit 'digital native' characteristics but are older. These would be termed digital immigrants by Prensky as they are aged between 22 and 26 years old. This shows that in our context, 'digital natives' are not simply young millennials as they span a range of ages.

Overall, the 'digital native' group is comprised evenly of male and female students from mostly high (45%) and average (36%) socio-economic groupings. In terms of home language, most speak English (32%)

Table 2. Survey questions used in the paper.

Question no.	Question	Options
A8	Do you use a computer off campus?	Yes/no
A9	If yes, where? (Select between one and three answers)	Work Where I live Internet café School/college Friend/relative Community centre Public library Residence Other (please list)
A11	Can you connect to the Internet off campus? If yes, what type of connection do you most often use? (Select only one answer)	Yes / No Dial up Broadband (ADSL) Cellphone (GPRS, 3G, HDDPA) Wireless
A18	When did you first start using a computer?	<2 years ago 2–4 years ago 4–6 years ago 6–10 years ago >15 years
A19	How did you originally learn to use a computer?	Taught myself Learnt from family Learnt from friends Through school Community course Training course at university Formal credit bearing course (e.g. semester long computer science, etc) Commercial training course (e.g. ICDL) Generally as part of my courses Other (please write)
A24	Where do you seek help when you have a problem doing something with ICTs?	(Please rank in order of 1 = first choice, 2 = second choice, etc) Problem solve yourself Ask friends Ask family. Ask institutional IT support Refer to manual/ help pages Lab assistant/ tutor/ lecturer Other (please list)

Digital native criteria	(n)	% of total
Total sample with age details provided	2743	
Number of sample under 22 yearsold	1804	66
Number of under 22-year olds with greater than 10 years experience	474	17
Number of subset that learnt to use ICTs themselves or through social networks	352	13
Number of subset that solves ICT problems themselves or through social networks	331	12

Table 3. How we determined the digital native subset of our 2007 survey data.

or Afrikaans (40%). They have excellent off-campus access at home (73%) often with more than one way of using computers off campus i.e. an additional portable device (40% of this group). They acknowledge the benefits of having easy access off campus *'quiet location, resources at my disposal, my own room, as much time as I want, no waiting, my own space to spread out'* [Digital Native (S2-I-2599)].

They also have high practical access as 41% have sole access to ICTs and of those who share access 30% are the primary users and 24% share access to ICTs equally. Of this group of 'digital natives', 75% rate their ICTs skills as good or excellent, and they know the value of this as indicated by this less than modest comment: *'I enjoy ICT as I'm able to navigate and find all that I need from the internet and do the required varsity work with ease so yes my knowledge and skills are perfect'* [Digital Native (S2-I-3056)].

Almost two-thirds (65%) have a high social use of ICTs, for some this being a priority: *'I enjoy it not for learning as it is complicated and boring, but for socializing with friends, being updated with the latest sports news and viewing the latest pictures of items and video clips of them'* [Digital Native (S2-I-2816)].

Being a digital native in South Africa clearly speaks of advantage. At the same time, this advantage is relative as in the South African context even 'digital natives' are operating within an environment of serious resource constraints relative to the rest of the world. South Africa has very poor bandwidth per Internet user. Current International Telecommunication Union figures show that South Africa operates on 852bits/s compared to 55 281 bits/s in the United Kingdom and 15 341 bits/s in the United States (International Telecommunication Union 2007).

Digital apartheid: deepening divides

The 'digital native' literature posits that one is either a native or an immigrant. What if one is not even in the picture? In South Africa, there are groups of students who do not exist in the prevailing millennial discussions.

There is an important group in our study of students (22% – 734 individuals) who lack both experience and opportunities, as they have been using a computer for fewer than 4 years; and have no direct access to ICTs off campus. These students do not fit into Prensky's notion of 'digital immigrants' as they are outsiders to the

digital world as it is commonly conceptualized. We have termed this contrasting group the 'digital stranger'.

The 'digital strangers' comprise more women (56%) than men, are largely South African (93%) with 80% speaking a South African language of African origin as their home language. Of the group, 93% describe their access to ICTs off campus as difficult with 49% having no access to ICTs off campus and a further 28% having very poor access off campus (i.e. only through a third party, e.g. Internet café, friends and family, or community centre/ library). Students are explicit regarding how much of a problem this is: *'it's a disadvantage for students who don't live on campus and don't have access to it at home'* [Digital Stranger (S2-H-1291)].

A closer look at how just one of these variables (socio-economic group – SEG) impacts on students' off-campus access (Fig 3) shows that 57% of students with no access to ICTs off campus are from low SEGs and 44% of those who access ICTs through a secondary source are from that same group. This does show a statistically significant relationship (Chi-square of 207 $P = 0.00$) although the association is weak (Cramer's V 0.18) (Kotrlík & Williams 2003).

Even for those who do have some level of access, this amounts to very low practical access as 68% share a computer with more than four people and 57% are not the primary user of the computer they have access to. Eleven per cent of students in this grouping think their ICT skills are poor and 44% think their skills are average. That they are aware of their outsider status is clear from their comments, of which the following two are typical: *'I am concerned that my ability, knowledge and access to using computer is very limited. It is important in my course and information about employment'* [Digital Stranger (S2-J 353)], and do not feel that enough is being done to assist them, *'I have lack of knowledge and I am concerned about my level of skills/knowledge. . . the support I receive does not meet my need and do not receive any training'* [Digital Stranger (S2-H-1715)].

Some of this group learnt to use ICTs originally through their community although the dominant way of acquiring ICT knowledge is through university training courses. These students rely strongly on university institutional support staff for help with ICTs problems.

Given South African social inequalities, and the current disparities in terms of ICT resources, it is not surprising that such a large group of millennial students

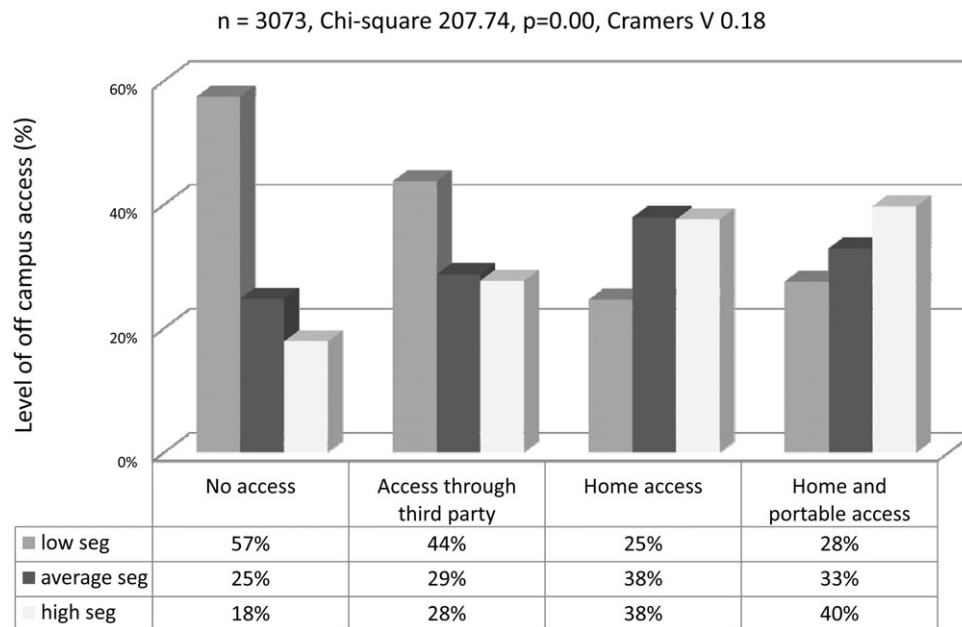


Fig 3 Types of access to ICTs off campus by socio-economic grouping.

have not had access physically or personally to ICTs. For many, this is a consequence of lack of access during schooling. In 2006, 67% of South African schools had no computers for learning (Department of Education 2007). Inequality of access is a reality for South African students from low socio-economic groupings, and those who do not speak English as a home language have been found to have very low access to ICTs off campus (Czerniewicz & Brown 2009).

Indeed, students are keenly aware of how their historically disadvantaged backgrounds have influenced their opportunities and they plead to *'make them [ICTs] accessible for the historically disadvantaged communities in rural areas'* [Digital Stranger (S2-J-262)] and *'I wish access would be made to learners from disadvantaged schools, because some of us are only exposed to ICTs here at university. Offer them in the languages they'll understand. Open a student ICT club in our universities esp historically black'* [Digital Stranger (S2-F-1162)].

Although the situation is stark in the South African context, the findings echo other studies which show that people who suffer social disadvantage are much more likely to be disengaged from ICTs than the socially advantaged (Helsper 2008a). Indeed, people who suffer deep social exclusion have no or little meaningful engagement with Internet-based services

(Helsper 2008a). It is exacerbated internationally by the marked gap between individuals who have access to newer forms of ICTs and those who do not (Traxler 2008).

Instead of the digital divide narrowing, there seems to be an increasingly widening chasm, where 'digital natives' are able to take advantage not just of ICTs but also of current trends such as ICT-mediated social networking and Web 2.0 technologies. 'Digital strangers' on the other hand, are not only lagging behind their 'native' counterparts at the start of their university careers but are falling even further behind as they have to prioritize their ICT use, and make hard choices which generally do not include making use of social software and exploiting Web 2.0 opportunities.⁶

Given these widely discrepant and varying levels of access and digital skills, how do educators and learning designers leverage the opportunities of ICTs for education? Surely, working with the small group of 'digital natives' in our context would constitute a wrongdoing in the face of the serious absences experienced by the 'digital stranger' group? This constitutes what fellow South African researchers call a 'dilemma of justice' (Broekman *et al.* 2002). How limited resources should be prioritized, and how opportunities leveraged across the full spectrum of South Africa's students pose a unique challenge for South African educators.

A possible digital democracy?

It is possible that this dilemma of justice may be solved from an unexpected quarter. Interrogation of our data reveals that in one respect, students do have fair and equivalent access to technology: cellphones. Among the South African university students we surveyed cellphone ownership was ubiquitous (98.5% in 2007) and not socially differentiated. In addition, cellphones were the main means of access to the Internet off campus by students from low SEGs⁷ which indicates that they are

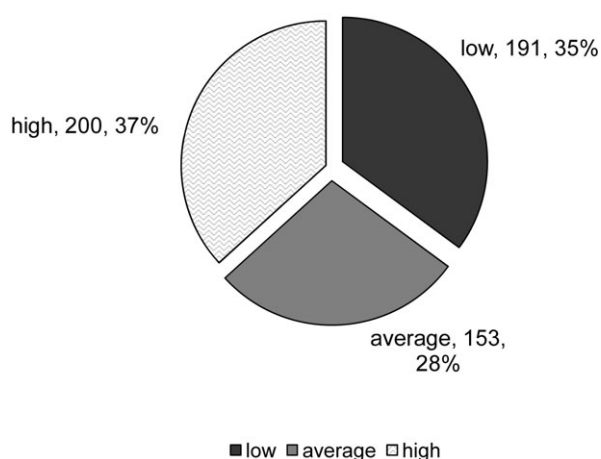


Fig 4 Students' use of mobile Internet by socio-economic group.

accessible by students from both ends of the economic spectrum (Fig 4).

Our findings were especially interesting given their use for learning as Fig 5 shows that cellphones are used by both groups of students for academic activities.⁸ We know from other South African studies that cellphones are prized by youth of all backgrounds. For example, a survey of low-income Black South African youth in an urban township (Kreutzer 2009) shows that the majority (83%) access the Internet via their phone on a typical day and about half of all these individual's expenses are spent on cellphones. Similarly, Bosch (2008) and Chigona *et al.* (2009) have shown the high adoption rate of MXit (a popular South African Mobile Instant Messaging service) among South African youth. The opportunities for cellphones to bridge the digital divide is not uniquely South African, nor is the use of mobile Internet in groups with low access to fixed line Internet. The Pew Internet Project has for years been measuring the 'divides' in access between African Americans and White Americans and have noted in their recent report (Horrigan 2009) that when 'tethered and wireless access are considered together, the gaps in online engagement between White and Black people largely dissipates'. Therefore, it was with special interest, that we noted that cellphones are reportedly used for learning to similar extents by students from both ends of our very polarized skills and experience spectrum.

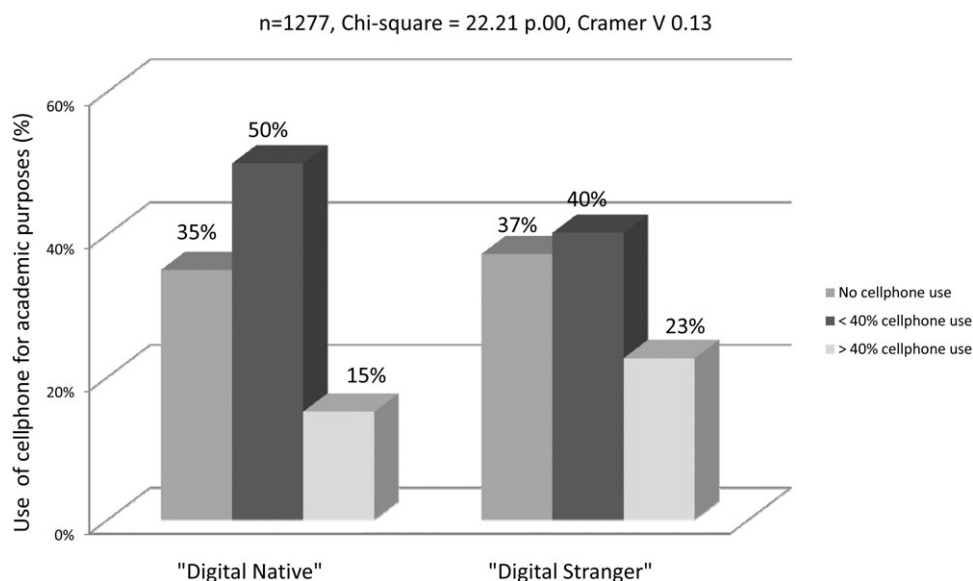


Fig 5 The percentage of overall cellphone time spent on learning activities: comparison of 'digital natives' and 'digital strangers'.

What makes the cellphone particularly relevant in this discussion about 'digital natives' and strangers is that they are equally distributed between both groupings and can be of 'like' value, an issue explored elsewhere (Czerniewicz & Brown 2010). In the 2007 survey, we did not delve into detail about the variety of uses of cellphones for learning, as this issue only arose out of the data analysis. However, in order to explore this further in the Phase 3 study we conducted in 2009, we examined students' levels of experiences and exposure to ICTS specifically in terms of cellphone use. This data allowed us to consider the use of the cellphone as a potential leveller in more detail.

Of particular interest is the value of cellphones to a subset of digital strangers (159 students) who reported very low use of computer-based technologies (58% never or hardly every use email, 71% never or hardly ever use the Internet for social purposes) along with very poor access to computers (52% have no access to computers off campus, 32% have access through a public facility or through a third party).

Yet all these students have cellphones and use them often for various activities; thus 72% report using SMS often and 34% report using cellphone chat often. Over a third (38%) use their cellphone as their only form of ICT access off campus. Of this group, half use their cellphone to access the Internet ($n = 54$) with searching the Internet via cellphone being a regular activity for 67% of this group.⁹

Several conditions make this such a viable option for students in South Africa. The country has the highest cellphone uptake in Africa and an unusually high mobile Internet-using population ranked 6th in the global top 10 for mobile Internet usage – ahead of both the United States and the United Kingdom (Opera Software 2009). The cost is also a relative enabler in that mobile web access is cheaper than other Internet options (Grandtruck 2009).

Conclusion

Our findings show that within the South African students sampled in our study there is a small group of elite students who share the basic characteristics of the 'digital native'. However the classification of this group has been based on simplistic criteria that only encapsulate their access to and skills in using technology. It does not examine the extent and depth of their technology use

nor the choices they make about this use. Previous research suggests that if we were to delve deeper we would find variation in use even within this high access group (Brown & Czerniewicz 2007).

This evidence necessitates a rethinking of how we define the digitally-mediated world. A serious problem with the concept of the 'digital native' is that it is an analogue one implying either/ or binaries rather than a continuum. It identifies students as being in or out, belonging or not belonging whereas they have more complicated identities and engage in a digital world in far more complex and heterogeneous ways. Thus, we suggest there would be value in reconceptualizing of 'native', 'net', and indeed of the term 'digital' itself.

It is clear too that the term 'digital' which has to date connoted computers needs to extend to concepts and affordances of mobility. By valuing and acknowledging the full spectrum of the term digital, it will be possible to take account of the full array of literacies which students utilize and all the affordances which they exploit, often in surprising and innovative ways. By redefining the concept of digital skills to extend beyond digital haves or digital have-nots, many more students would be able to be more accurately positioned in relation to their actual digitally-mediated experiences.

It is crucial that we as educators, as academics and as educational technologists reject deterministic and exclusionary labels and actively change this discourse. Our research makes it clear that students who are classified as outsiders because of age or lack of computer experience are not without digital skills in various shapes and forms. That the world is increasingly shaped by digital technologies is not in doubt. Everyone engages somehow, everyone makes their own meaning; everyone mediates those technologies in one way or another. The challenge is therefore to situate our responses in that rich diversity, rather than in exclusionary dichotomies.

Digital natives in the form of digital elites have dominated the educational technology discourse at the expense of other students for too long. We thus propose reclaiming the notion of the 'digitizen'. A concept such as this would acknowledge the full spectrum of digital capabilities (thinking beyond computers) in varied configurations. It would allow for notions of access as being determined by connectivity and not location, and the acknowledgement of skills based on what students are able to achieve rather than the mastery of a device.

This does pose new challenges for students and educators alike. We need to design for increased diversity and new practices, not treating cellphones and mobility as secondary devices or locations of learning. We need to leverage contemporary literacies, and emergent cellphone-mediated practices in ways which support teaching and learning. We need to fully understand the ways that students are exploiting the affordances of mobility as they use cellphones for access and use in unanticipated ways. A rigorous conception of emerging digital practices coupled with expert knowledge of learning design might make the possibility of a digital democracy in higher education a reality, not simply the pot of gold at the end of the rainbow.

Acknowledgements

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Notes

¹Western Cape.

²Gauteng, Limpopo, North West, Free State and the Eastern Cape.

³The full survey can be viewed online at <http://www.cet.uct.ac.za/virtualmobius>.

⁴The argument presented in this paper is best supported by the quantitative data. While some qualitative data is included here, this is mostly reported elsewhere.

⁵The latter perhaps because 3 of the 6 institutions were noted as having high numbers of international students ranging between 8–10%.

⁶We have previously shown how students with unfavourable off-campus access to ICTs have to make hard choices and developed strategies in order to engage with ICTs for their learning Czerniewicz *et al.* (2008). 'Students make a plan: understanding student agency in constraining conditions.' *ALT-Journal of Research in Learning Technology* 17(2): 75–88. This often entails focusing on the necessities of academic requirements rather than non-essential social or personal use.

⁷The reasons and implications for this especially in the light of student agency and structural constraints is discussed elsewhere – see Czerniewicz *et al.* (2009). 'Students make a plan: understanding student agency in constraining conditions.' *ALT-Journal of Research in Learning Technology* 17(2).

⁸The Cramer V-value of 0.13 can be interpreted as showing a weak association or effect between the type of category and cellphone use Kotlik and Williams (2003). 'The incorporation of effect size in information technology, learning and performance research.' *Information Technology, Learning and Performance Journal* 21(1): 1–7.

⁹A variety of mobile learning initiatives utilizing cellphone chat software such as MXit including Dr Math and Imfundo Yami/Yethu demonstrate the power of these simple tools for learning. Vosloo and Botha (2009). *Mobile Learning: South African examples*. Mobile Learning Institute Summit, Lusaka, Zambia, 24–27 June 2009.

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