ICT access-user-use relationships in teaching / learning in higher education in South Africa

University of Cape Town, South Africa (UCT)

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Final Project Report
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# Table of contents

Abstract ................................................................................................................................................... 3  
The research problem .............................................................................................................................. 4  
Objectives ............................................................................................................................................... 4  
Methodology ........................................................................................................................................... 6  
Project Activities ..................................................................................................................................... 9  
Research Findings .................................................................................................................................. 12  
  Digital Natives and digital strangers ................................................................................................. 12  
  Habitus of ‘digital strangers’ ............................................................................................................. 13  
  Bourdieu’s framework for examining students’ cultural capital ....................................................... 13  
  The relationship between students’ social and the academic communication networks .......... 13  
  Gender and ICTs ................................................................................................................................ 14  
Research outputs ................................................................................................................................... 14  
Project Outcomes .................................................................................................................................. 15  
  The value of ethnographic action researchers (EARs). ................................................................. 15  
  Language issues during data collection ......................................................................................... 15  
  Focus groups .................................................................................................................................. 16  
  Digital Stories ................................................................................................................................... 16  
Overall Assessment ............................................................................................................................... 16  
Bibliography ......................................................................................................................................... 17  
Appendix 1: Project outputs to date ...................................................................................................... 18
Abstract
This report describes the Centre for Educational Technology, University of Cape Town’s research project which investigates information and communication technologies (ICT) access and use relationships amongst clusters of first-year university students. The project initially involved a short survey of students across five universities in South Africa. This was followed up by telephone interviews with 114 students and focus groups with a subset of 42 students. When an extension to the project was granted, a new phase of data collection was added using an additional methodology, that of digital semi-ethnographies, to enable the observation and capturing of additional insights into students’ day-to-day activities. Four Ethnographic Action Researchers (EARs) at four different universities across South Africa were appointed; they in turn recruited a total of 23 students to participate in the project throughout 2011. The EARs collected a range of data from each participant including interviews, online observations and video diaries. Two face to face workshops with the Project Team and the EARs took place culminating in a Digital Story workshop (involving four of the student participants) at the end of 2011. The last six months of the grant were spent coding for data analysis using NVivo software and undertaking preparatory work for writing and sharing research findings, an ongoing process which continues beyond the life of the project’s grant period.

IDRC project: ICT Access and Usage in Higher Education in South Africa, no. 105267, approval date of November 7, 2008
The research problem

The overall objective of this research project has been to explain the character of the complex relationships between ICT access and ICT uses for learning and teaching and how these intersect with students’ everyday lives.

The assumption in ICT in Higher Education policies is that increased access to ICTs leads in a fairly straightforward way to more use. Research we conducted in two quantitative studies of university students’ access to and use of ICTs revealed a significant relationship between high frequencies of access and high frequency of use; however increased access did not necessarily lead to a more varied use. We also found demographically differentiated use in off-campus contexts. At the same time, the international literature showed that even in high access situations, differentiated access occurs by demographic group, while the use of ICTs for learning is differentiated creating a usage gap amongst even people with fairly equally access.

Working on the premise that physical access is likely to increase in higher education in South Africa in the short to medium term, it is important to develop a more nuanced understanding of the relationship between access and use in specific formations. Current indications are that even in conditions of low access, there are groups where use is reasonably high suggesting that other factors are at play enabling use. In addition, in conditions of moderate to high access there are non-user groups prompting the need to identify those factors inhibiting use in such contexts. And finally, there is indication of a digital differentiation occurring in South Africa as elsewhere i.e. even in high access conditions there are complex differences of use due to demographic differences and other contributing factors.

The research project therefore set out to explain the occurrence of the particular events identified in in different “access-use-user” groupings. Our preliminary theoretical formulations suggested that specific forms of technological habitus exist; the intention was to theoretically and empirically investigate the veracity of this concept.

In an environment where institutional and state resources are increasingly being invested in ICTs in education, such an explanation is essential to an understanding of the conditions which are likely to enable or constrain effective use of ICTs for teaching and learning in higher education in future.

Objectives

The overall objective of this research project is to explain the character of the complex relationships between ICT access and ICT uses for learning and teaching in higher education.

In exploring our first objective (which was to describe and explain these relationships within three specific clusters of low/high access-use-user groupings) we realized that there were more complex and different clusters of students to those we had anticipated in our proposal. We became interested in students at polar ends of the spectrum of digital experiences, namely the Digital Elite and Digital Strangers.

We found that our conceptualisation of low or non-use as it had emerged in Phases 1 & 2, no longer appeared valid when we began the investigation. It was no longer possible to find students who did not use technology in some way. But what we did find was that there were students who did not use ICTs for a particular purpose. We could identify specific areas of low use compared
to peers including: low users of social networking, or low-users of ICTs in university courses or a relatively lower use of computer based ICTs (as opposed to cell phone based ICTs) or vice versa.

This focused our attention on a new cluster of students – those with low access and low use – a group we termed “digital strangers”. Within this group were students who met the criteria of digital strangers (fewer than 4 years of experience using ICTs, low reported use of computer-based technologies, difficult off-campus access); yet these students had access to cell phones and they used them for academic purposes. Having identified these students in the survey undertaken at the beginning of the first year of the project, we focused attention on them during the interviews and the focus groups.

We were also able interrogate the notion of the “digital native”, a concept used globally to describe a generation of young people who have grown up with digital technology and representing a supposedly new kind of student entering higher education (Prensky 2001). We were able to show that within South Africa 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 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 and Czerniewicz 2007).

This led us to our second objective which was to describe the specific features of a particular technological habitus for particular clusters of users. Our analysis to date had indicated that some students’ technological habitus has been reconfigured by access to specific forms of cultural capital such as the cell phone. We had only been able to surmise when and how this occurred and how it plays out in practice. Consequently this became a strong focus of our second phase of data collection in 2011. We specifically asked students more about the role of the cell phone in their university lives.

As we have concluded in one recent publication that drew on the current research (Czerniewicz and Brown 2010), the student stories we have uncovered and described “further demonstrate the complex and multifaceted concept of access to information and communication technologies.” We believe that we are starting to demonstrate the capacity of “one particular material object (the cell phone) – economically accessible to a wide range of South African students – to facilitate the expedient acquisition of embodied capital necessary to make meaningful use of ICTs for the purpose of learning (Czerniewicz and Brown 2010).”

Our third objective was to report the findings to key stakeholders, extrapolating the implications for higher education decision-makers, for educators and for learning/curriculum designers. This we have done continuously throughout the project and highlights include profiling of this research at Elearning Africa 2011 and acceptance of a paper in the British Journal of Educational Technology.
Methodology

The project as a whole is best described as having adopted a mixed-method approach, as described by Creswell (1994). This approach was based on the need 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 academic staff and students in the study. It also allowed us to deepen the investigation even at the early “broad brushstroke” phase of the work. Our quantitative statistical analysis has been both descriptive and exploratory and we used qualitative data from open-ended questions in the primarily quantitative survey to elaborate on survey results. We used a few selected supplementary interviews to extend the breadth of the inquiry. This is a well-established approach in social science research which can “illuminate quantitative data, reducing the need for speculation or subjective interpretations” on the part of researchers (Selwyn 2000).

This research takes the form of an explanatory case study as it seeks to investigate a contemporary phenomenon in a real life context and explain the presumed causal links between real life interventions that are too complex for a survey strategy (Yin 2003). It is a case study of use and non-use of ICTs for the purpose of learning amongst students in higher education in South Africa. We involved students across five South African universities namely University of Fort Hare (UFH), Rhodes University (RU), University of Cape Town (UCT), Walter Sisulu University (WSU) and University of the Free State (UFS).

We began with a short one-page questionnaire which we asked participating institutions to hand out to students in “venues” where we were likely to obtain the range of access/use experiences we had set out in the proposal. The questionnaire was based on survey questions from the 2007 research project (Brown and Czerniewicz 2008) that provided us with the most accurate reflection of students’ levels of access and use of ICTs. The questionnaire was used as the basis for classifying the students into two units of analysis namely; ‘digital natives” and “digital strangers”.

Our methodology was three-fold and included two parts. Part 1 was conducted in 2009 and involved structured phone interviews with 114 students and then a follow up interview with a further subset of 42 students. This was followed by focus groups with the subset of 42 students held face to face at the students’ respective universities. Part 2 was conducted in 2011 as an addendum to the original project so as to deepen the project through an additional methodological approach – digital semi-ethnographies – that would enable us to observe and capture additional insights into students’ day-to-day activities.

Whilst the project was co-ordinated by UCT, we had a wide range of support and participation from colleagues and researchers in all our institutions

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<thead>
<tr>
<th>Position</th>
<th>Person</th>
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<tbody>
<tr>
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<td>Laura Czerniewicz</td>
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<td>Zolani Kupe</td>
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<td>Ethnographic Action Researcher</td>
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<td>Rhodes University</td>
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Part 1: Interviews and focus groups

We began interviews with students in April 2009 utilising our intended methodology of structured phone interviews. The primary researcher and two research assistants undertook a pilot of the interviews on the basis of which the research instrument was refined.

Initially, we classified the students into access/use groups based on their questionnaire responses. We then selected a sample based on equivalent gender and institutional distribution. However, this soon proved problematic as some students were simply unreachable, never answering emails or cell phone calls. We were therefore forced to adopt a more open-ended approach and group students later.

The researcher and assistants conducted 114 first-round interviews over a whole range of time periods including lunchtimes, evenings and weekends in order to maximise the opportunity to get in contact with students. The primary researcher kept a track of the groupings of the sample, adjusted and targeted the gaps where possible.

We then conducted a second telephone interview with a subset of 42 students between July and September 2009. We found the first interview was mainly descriptive while in the second interview we could probe further regarding the extent to which technology was part of students’ lives (both computers and cell phones), and what purposes or reasons the students had for using ICTs both personally and at university.

The focus groups were conducted between September 2009 and October 2009. A pilot was conducted in September with a small group of University of Cape Town students. The focus groups built on the prior interviews. They were semi-structured and relatively open-ended with the researchers using key prompts. These included asking students to describe their ICT journeys, trawling for the metaphors students used to describe ICTs and asking students to draw diagrams of their ICT networks. These varied mechanisms were intended to draw out the previously “unsaid” or unexplored aspects of access and use.

It was interesting that students drew on and commented on one another’s’ experiences. Once one student admitted to particular “non-desirable” practices – like cutting and pasting from website or text chatting during lectures –, others would follow suit. The focus groups added valuable dimensions to the research through these kinds of interactions and the more nuanced way that participants spoke about their experiences.

Part 2: Ethnographic Action Research

Ethnography has been defined by Creswell (Creswell 2009) as description and interpretation of a cultural or social group of system. It involves prolonged observation of a group in which a researcher is immersed in the day-to-day lives of people. Digital media allows researchers to capitalise on ICTs to extend participant observation beyond boundaries. Experiences are communicated via the internet (particularly social networking sites), and data is gathered in the form of words, images, audio and video clips (Masten and Plowman 2003).
Ethnographic Action Research (EAR) is a methodology that has been utilised in development projects and aims to combine participatory techniques and ethnographic approaches into an action research framework (Tacchi, Foth et al. 2009).

One of the aspects of this approach that interested us was the opportunity it offered for capacity building in South African universities. In this methodology, an Ethnographic Action Researcher (EAR) was trained for each research site. We selected four of the original five research sites for this next phase of research, namely University of Fort Hare, Rhodes University, University of the Free State and University of Cape Town. These comprised a large traditional English-medium research intensive university, a previously disadvantaged rural university, a previously advantaged and recently merged Afrikaans university and a small traditional English medium teaching intensive university.

We distributed a position description and selection criteria for our desired EARs to e-learning colleagues at each site and sought their recommendation for suitable candidates. We then made contact with each person to talk about the project and assess their suitability in terms of our projects requirements.

The project Ethnographic Action Researchers (EARs)

Four researchers were selected, one from each institution. A brief overview of them is presented here.

**Nompilo Tshuma** started working in the Centre for Higher Education, Research, Teaching and Learning (CHERTL) at Rhodes University at the start of 2011. She has an MSc in Computer Science from Zimbabwe and a Postgraduate Diploma in Higher Education from Rhodes in South Africa. She was recommended by the Coordinator of Educational Technology in CHERTL as she is involved in the running of their Learning Management System and training of lecturers and also in the implementation of several applications to aid students in their learning.

**Hennie Erasmus** is a student at the University of the Free State finishing his Honours in Industrial Psychology. He was recommended by the head of the E-Learning Division in the Centre for Higher Education Studies and Development where he was working part time as a facilitator for their Learning Management System.

**Adone Kitching** is an Anthropology Honours student at the University of Cape Town. She majored in Social Anthropology and Political Sciences in her BA and indicated her interest in participating in the project when we presented it to a postgraduate group in the department as a potential Honours project. The project tied in with Adone’s personal research interests about the role of ICTs and social media in new conceptions of the self, new forms of knowledge production and the opportunities for innovation created by information sharing and she explored the “Facebook as mediator in social reality” as part of her Honours dissertation.

**Karen Ngwenya** is a Zimbabwean student studying for her Masters in Library and Information Science at the University of Fort Hare, where she also completed her Honours where she examined the role of ICTs in service delivery in academic libraries in South Africa. She was recommended to us by the Head of Department as she had an interest in how ICTs are being used in libraries and was continuing on to her Masters.

The EAR researchers who interestingly ranged in age from 22 – 32 years, identified and established relationships with student participants. They conducted interviews, undertook observations, collected data from digital diaries and facilitated focus groups at the respective institutions under the guidance of the research team. They also participated in the digital lives of the participants through various forms of social media. The EARs’ observations, learning and insights thus also became a source of project data.
The EAR methodology enabled the project team to obtain data resulting from the EARs continuous engagement with a total of 23 students across a range of universities. This would not have been possible without the use of the EARs as they understood and were embedded in the context of the students. They were available to the students and were able to establish a relationship with them.

Project Activities

Part 1: Establishing the sample group

Early on in the project we sought to establish a basis from which to draw our sample of students. In the original project proposal we had hoped to draw on students directly from the 2007 survey of South African students’ access to and use of ICTs. However, given the time gap between the proposal and the start of the project this strategy was insufficient. We were successful in contacting some students from the original survey (primarily from University of Limpopo and University of the Free State) but in many cases these students were no longer at university. Others were no longer contactable on the emails/cell numbers they had originally provided.

We thus devised a second strategy and developed a short one-page questionnaire which we asked participating institutions to hand out to students in “venues” where we were likely to obtain the range of access/use experiences that we had set out in the proposal. Students across five universities (Fort Hare, Rhodes, UCT, Walter Sisulu and Free State) completed our questionnaire. The identified sites were: computer literacy training; information skills training courses where the introduction to computers was a key component; courses where students use ICTs as a requirement of the disciplines e.g. computer science and information systems; and courses using online learning as a key component.

The surveys were used as the basis for classifying the students into the access/use user groupings outlined in our project proposal namely non users, low access and moderate/high use, and digitally differentiated use in high access conditions, i.e. high access-low use and high access-high use

Conducting interviews

We began interviews with students in April 2009 utilising our intended methodology of structured phone interviews. The primary researcher and two research assistants undertook a pilot of the interviews on the basis of which the research instrument was refined. We then conducted a second telephone interview with a subset of 42 students between July and September 2009. We found the first interview was mainly descriptive while in the second interview we could probe further regarding the extent to which technology was part of students’ lives (both computers and cell phones), and what purposes or reasons they had for using ICTs both personally and at university.

Focus groups

The focus groups were conducted between September 2009 and October 2009. A pilot was conducted in September with a small group of University of Cape Town students. This was followed by five focus group session conducted across South Africa by various members of the project team:

- Walter Sisulu University – conducted by primary researcher Cheryl Brown and isiXhosa research assistant Zolani Kupe
- University of Fort Hare – primary researcher Cheryl Brown and isiXhosa research assistant Zolani Kupe
- Rhodes University– conducted by primary researcher Cheryl Brown
- University of Limpopo– conducted by primary researcher Cheryl Brown
- University of Free State– conducted by project director Laura Czerniewicz
Part 2: The first project team workshop

The project team met for the first time face to face at a workshop hosted in Cape Town on 31 March and 1 April 2011. We started the workshop with familiarisation activities, and talking about the project and its objectives so the EARs could become familiar with what we wanted to achieve. Then we developed research plans as a group looking at how we would recruit participants, what types of data we needed to collect (and what skills and knowledge the EARs would need to do that). We also planned to document and communicate with each other about the process once everyone was back in their own institutions using a project website on our institutional learning management system.

Student Participants

The EARs then returned to their respective universities and employed a variety of strategies to recruit participants. During the workshop we had developed criteria for selection of participants namely that they had to be first-year students, drawn from either a Social Science/Humanities discipline or Science discipline. There also needed to be a fairly even mix of gender, and a range of students from different home backgrounds such as rural and urban, SADC\textsuperscript{1} and South African. We were also interested in students who lived in residences while at university and those who lived off campus. So the criterion for participation was to be a first-year student in one of the five participating universities, and we sought diversity in terms of discipline of study, gender, rural/urban background, and on/off campus living.

We developed a poster for the EARs to adapt to use to garner students’ interest and provided them with information sheets and consent forms. Ethical approval was sought through our Centre for Higher Education Development Research Ethics committee at UCT as well as at two of the other institutions that had their own internal ethics approval process for research conducted with students at their own institutions. One institution did not require further ethics approval for the research.

The final sample for participation in the Ethnographic Action Research activity consisted of 26 students. Whilst we strived for balance in terms of the demographic criteria mentioned, this was hard to obtain as participants were self-selecting. In addition, and quite understandably, over the year some students did drop out of the study. Students were all in their first year of university and ranged between 18 and 20 years of age. Two-thirds of the participants were female, the majority were South African with five students from Zimbabwe. With regard to disciplinary location, 14 were undertaking degrees in the Arts/Humanities and the other 11 in the Natural Sciences.

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<tr>
<th>Person</th>
<th>1 Sex</th>
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<th>3 University</th>
<th>4 Degree</th>
<th>5 Residency</th>
<th>6 Urban/rural</th>
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<td>Urban</td>
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\textsuperscript{1} SADC: Southern African Development Community (comprised of ___ member states, including South Africa)
Data Collection
All participants were interviewed at least twice by the EARs. The first interview was exploratory and has a large relationship-building component. The participants were asked about the role of ICTs in their lives before they came to university and then generally about what they did with technology both academically and socially. In the second interview the EARs focused more specifically on their use of ICTs for learning, and the students showed the EARs what they did in their courses and even what applications they used on their cell phones. Participants were provided with small Kodak video cameras and asked to make video diaries. In doing this we drew on the Day Experience Method which involved selecting a day and SMSing students at certain times throughout the day asking them to record where they were, and what they were doing with technology. This provided us with a view into the students’ lives and the role technology plays. Students also consented to their social media interactions being observed by the EARs. The dominate observations took place in Facebook. Whilst the EARs were able to interact with students this way regularly, we selected a 7-day period in which to record these observations systematically, and the EARs took screenshots of the social media use during this period. The timing of the various strategies varied according to university semester timetables, participants’ availability, and the personal style of the researchers.

The Second Workshop
The second face-to-face workshop for the project team was held in mid-August of 2011. Here we revisited the project goals, the process and progress of data collection and reviewed project progress to date. It was very productive as the researchers were able to talk about their progress face to face, and as project leaders we were able to provide feedback and align (and re-align) activities with project goals. This enabled us to plan for the final stage of data collection as well as ensure some further consistency among the work of the researchers across the four universities.

Digital Story Workshop
At the end of November 2011 three of the EARs (one was unfortunately taken ill suddenly) and four students (one from each institution) attended a three-day workshop along with the Project Leader and Researcher and two research assistants. Given the focus on “students’ voices” we decided this would be an illuminating and valuable way of enabling the students and EARs to produce digital stories of their own ICT experiences during the project. Our Centre is fortunate to have a Digital Learning Materials Designer who has conducted previous workshops on Digital Stories. She led the group in explaining what digital stories are and providing the participants with the skills to develop their own stories using specialised software. The process involved developing a script, importing images, videos, and sound and developing a film clip with a voice over narration. At the end of the three days we had a screening of all seven of the video clips produced by the group. Five of the stories have since been technically edited and will be available through the Project Leader’s blog.
(lauraczerniewicz.uct.ac.za) later in 2012, once participants have viewed the edited versions and given
the go-ahead for them to be made public.

Analysis
The amount of data generated by the project was immense. We adopted an analyse-as-we go approach
with the Lead Researcher working closely with research assistants throughout the project. Our initial
approach to data analysis was theory driven. We drew on Bourdieu’s theory of capitals, fields and
habitus (which has been the basis for this project) to categorise and group interview data. Initially we
did this for 10 transcripts and double checked our analytical strategy as a research team. We then
progressed to an analysis of all the transcripts in this way.

The qualitative was then linked back to the survey data and we categorised students into our access-
use-user groupings of digital natives and digital strangers for in-depth analysis.

As we progressed with the analysis, we began to notice differences between different groups of
students. We became interested in whether these differences were because of omissions, i.e. because
of absence in that experience in a particular student group, or because students did not mention the
experience because they did not regard it as relevant or important. However, as both of these
methodologies were conducted at a specific moment in time, there was little opportunity to revisit the
issue with the students and seek clarification. This limitation in our data collection process is
acknowledged in the literature. Qualitative researchers regard the ideal as long-term participant
observation because it provides more complete data and enables the researcher to provide a fuller and
revealing picture of what is going on (Maxwell 2008). This does not negate the value of the
information we have to date; rather it will allow better assessment of the generality of the
explanations we are exploring.

We prioritised the use of student interview data for the second part of the project. The interviews were
semi structured. The aim was to obtain certain basic information about students’ ICT practices.
Researchers were provided with an interview guide but the style of the interviews differed according
to researcher and participant. Data analysis was conducted centrally by two researchers using a semi
grounded approach. They began by listening to the interviews and then developing constructs based
on the students’ responses. These were then grouped into categories based on and aligned with the
original research questions. The categories were however tightly bounded as the interviews did focus
quite specifically on students’ access to and ICT use in their first year at university. Once the coding
constructs were developed, they were coded using the qualitative software Nvivo. As new codes
emerged, they were incorporated into the code sheet. The coding was conducted primarily by one
researcher. Regular reports were generated as the coding progressed and interpretations were checked
regularly at project team meetings. Nvivo was useful in enabling the importing and coding of the
video data.

Research Findings

Digital Natives and digital strangers
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. This evidence necessitates a rethink 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. 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.

Habitus of ‘digital strangers’

Computers are valued as the dominant form of technology in higher education. As an educational tool they are prioritised in higher education, and institutional structures seldom exploit the ubiquitous mobile as an administrative or learning strategy. However, cell phones are clearly essential to digital strangers’ personal identities; yet at the same time are inevitably mixed up as part of their scholarly identities. Digital strangers have mixed feelings about this and appear to acknowledge and value computers more highly than cell phone in the field of higher education yet practically often have to use their cell phone as a necessity. In terms of cultural capital, they bring practical abilities and dispositions from cell phones to bear on their learning practices even as they themselves do not necessarily consider these skills as transferable or valued. One might suggest that through the students’ habitus, a new form of objectified capital—the cell phone—is testing the existing dominance vested in the legitimate form of technology—the computer.

Bourdieu’s framework for examining students’ cultural capital

Bourdieu’s framework has allowed the exploration has provided a useful tool to demonstrate the complex and multi-faceted concept of access to higher education as mediated by ICTs, expanding the notion beyond the simpler one of mere access to the technology itself. We have noted that it is through habitus that individuals are able to appropriate and maximise different forms of cultural capital. South African universities have mixed responses to the use of cell phones with few utilising them proactively for educational ends; indeed some academics even ban their use in lecture theatres. Even so, students are using this technology to access the practices of higher education, often without the knowledge and buy-in of the institutional authorities. The assumption is always that it is embodied capital which is required for the objectified state of cultural capital to have any meaning, but this study suggests that the acquisition of a particular form of objectified capital (i.e. the cell phone) has an influence on – indeed transfers to – the embodied capital itself.

The relationship between students’ social and the academic communication networks

Overall the findings confirmed previous research that there are strong boundaries between students’ academic and social practices. Whilst there are still strong boundaries when it comes to cell phones which are used predominantly for social purposes, interestingly there is evidence of a convergence (weakening of boundaries) in relation to the computer, which spans a range of academic and social purposes. Students do not seem to place a high significance on academic activities within their technological networks. Generally the academic activities were situated in
positions of visual representation that suggest they are regarded as factual, unexciting and non-negotiable. This does not necessarily mean it is not an important part of their university life but rather suggests an acceptance and use based on need or requirements.

Gender and ICTs
The data reported on here confirms that there does not seem to be systematic gendered divide amongst higher education students, but also provides evidence that South African students understand their context to contain inequities, especially in terms of female students facing the challenges of juggling responsibilities, thwarting stereotypes, and affirming their competence. Perceptions of gendered differences in types of use also emerged with contradictory suggestions that female students are more strategically focused on their studies (or not!) as well as differences in the way male and female student use ICTs socially. These findings provided by reviewing perceptions on gender and ICTs provide an excellent step towards analysing the data more systematically in terms of our theoretical framework for this project, using Bourdieu’s notion of habitus. This offers the opportunity to incorporate individuals’ contexts and to include the influence of social backgrounds to an understanding of these issues.

Research outputs
A total list of project outputs is contained in Appendix 1. As per the proposal, outputs included both academic journal publications and conference proceedings as well as other more informal and accessible forms of research dissemination ranging from presentations within South Africa to keynotes internationally. The table below shows the outputs which we undertook as per the proposal and the outputs we achieved as part of the project. In all cases we have managed to exceed the proposed outputs.

<table>
<thead>
<tr>
<th>Outputs as per proposal</th>
<th>Outputs achieved</th>
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<tbody>
<tr>
<td>2 peer-reviewed papers (either in conference proceedings or journals)</td>
<td>See Appendix Numbers 2, 3, 4, 5, 12, 13, 16, 17, 19, 20, 22, 23, 24, 26</td>
</tr>
<tr>
<td>Highlights:</td>
<td></td>
</tr>
<tr>
<td>Papers published in <em>Journal of Computer Assisted Learning</em> and <em>British Journal of Educational Technology</em></td>
<td></td>
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<tr>
<td>Keynote at the International Conference of E-learning (ICEL) in Toronto in 2010 Invited book chapter for Exploring the Theory, Pedagogy and Practice of Networked Learning in 2011 and Rethinking Learning for a Digital Age in 2010</td>
<td></td>
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<tr>
<td>Presentation of academic papers at local peer reviewed conference</td>
<td>See Appendix Numbers 6, 14, 18, 21</td>
</tr>
<tr>
<td>Highlights:</td>
<td></td>
</tr>
<tr>
<td>Paper presented at E-learning Update (a bi-annual South African wide symposium) held in Johannesburg in 2010 and Higher Education Learning and Teaching Association of South Africa (HELTASA) Conference held in Polokwane in 2010</td>
<td></td>
</tr>
<tr>
<td>Popularised more accessible versions of findings Presentation of findings to policy makers and administrators and higher education bodies Dissemination at non-peer-reviewed</td>
<td>See Appendix Numbers 1, 7, 8, 9, 10, 11, 21, 14, 15, 18, 25</td>
</tr>
</tbody>
</table>
conferences and forums
On going through website and blogs
leadership strategic symposium at University of Kwazulu/Natal in 2010; and ICTs and Higher Education Conference in Johannesburg in 2010
Article in E-learning Africa news portal, 2011,
In addition copies of papers and presentation published on the Centre for Educational Technology website, and project participants blogs

Dissemination in participating institutions
See Appendix Numbers 7, 8, 9, 10 & 21 and forthcoming
Where possible we presented seminars at participating institutions. We have and will still present findings at the Higher Education Learning and Teaching Association conference in 2010 and 2012 as this is a forum that our collaborators attend.

Project Outcomes

Even though the project period has officially ended, there is work still to be done writing up the findings, and disseminating them in various forms. This means that the effects of the research cannot yet be fully ascertained. Nevertheless, the process of undertaking the research did provide insights, some of which can be articulated now.

The value of ethnographic action researchers (EARs)
The incorporation of ethnographic action research proved valuable two counts, first in terms of gaining the trust of the students being interviewed in ways that would be more difficult with older more established researchers at a distance geographically from the subjects of the research. The second valuable aspect was to the ethnographic action researchers themselves, as the approach is a form of capacity development itself. The EARs themselves reported that they gained valuable insights into their own context and that of other students through the project. The research methodologies drawn on in the project were new to many of them and our process of scaffolding their research activities helped the four students acquire new skills as researchers.

Language issues during data collection
It emerged during the data collection phase that we had not considered the implications of language barriers sufficiently in the research design. This was not an issue for all students who spoke English as a second language. Speakers of sePedi in Limpopo were very comfortable conducting phones interviews in English, whereas isiXhosa speakers from the Eastern Cape turned out not to be as comfortable. Consequently we employed an isiXhosa interviewer who assisted with telephone interviews and focus groups. This lead to a dramatic improvement in students’ participation and their engagement with the research questions. This level of engagement was also seen in the second phase of the project with the inclusion of the on-the-ground Ethnographic Action Researchers. Clearly it is a more effective research approach to have someone who understands the participants collect and formatively analyse the research data, both in terms of language and in terms of their broader contexts.
Focus groups
Focus groups proved to be much more expensive than originally budgeted. There were two reasons. First, we found ourselves in the fortunate position of identifying student participants at all six universities, which we had not expected. Rather than trying to make difficult choices about which institution would prove the most useful, we decided to undertake focus groups with students at all six. Second, in addition due to students’ university commitments, the best time to meet turned out to be at the end of the day. This meant that in all cases we had to organise overnight accommodation for the research team which we had not anticipated doing. However the richness of the data and the enthusiasm of the students made these worthwhile experiences, and we feel sure that the quality of the data which has emerged from these sessions will have made this worthwhile.

Digital Stories
The production of digital stories – in video format – proved to be an illuminating and creative process, providing useful reflections and insights for the participants in the digital stories workshop, which, as mentioned earlier, included the project team and one student from each of _ universities involved in the project. It was also intriguing how the groups, from different contexts, all had a core message about their ICT experience during the year – the role of the cell phone as an integral technology which supported them as students. The downside was that by giving the researchers and student participants freedom to develop their own individual stories, we were unable to monitor the use of online resources (i.e. images and music) and ensure that they were openly licensed. This meant that once the stories were complete, we needed to have the images and music checked to ensure that all were open access so we could make the stories publically available. This formed part of the technical editing process which has delayed making the stories available online although does not negate our sharing of these in presentations and conferences. When we use digital stories again, we will need to better design the creation process, for example with the openly licensed materials from the outset.

Forthcoming Research Output
As with many research projects, the process of synthesising analysis and writing up research findings occurs well beyond the end date of the project. We thus have some forthcoming research outputs which have been confirmed, while others are still in progress.


Czerniewicz, L and Brown, C (2012) ‘Rural South African university students’ technological habitus’ Paper accepted for Higher Education Learning and Teaching Association (HELTASA) conference to be held at Stellenbosch, November

Brown C., & Czerniewicz, L. (2012) ‘Social networks = social capital: First year students’ use of Facebook for cognitive and affective learning’. Paper accepted for Higher Education Learning and Teaching Association (HELTASA) conference to be held at Stellenbosch, November

Overall Assessment
We have been grateful for the research grant and for the opportunity to pay close attention to students’ digitally mediated practices. Overall our assessment includes the following observations:

- Our research has contributed to the knowledge base regarding students’ digitally mediated practices, an area of paucity especially in developing country contexts.
- The research has enabled exploration of spatial and temporal use of ICTs both socially and for learning (amongst users of ICTs) during the first year experience at university in South Africa. It
has specifically contributed to the First Year Experience Initiative, a cross-university programme at the University of Cape Town.

- The ethnographic approach we used provided multi-sensory, multi-dimensional and experiential insight into students’ lives.
- Through the use of Ethnographic Action Research, we developed research capacity among postgraduate students, including in non-research intensive and rural universities in South Africa.
- We provided greater insights to the educational technology community on how students’ technological habitus develops, is configured and potentially changes.
- Our research findings feed into the work of the Centre for Educational Technology at the University of Cape Town, as well as into institutional planning processes more broadly at the University. For example it informed our Centre's reconceptualisation of Computer Literacy into the broader more relevant notion of Digital Literacy.
- Our approach of “analyse–as–you–go” and of write and publish during the project rather than after the project ended yielded a pleasing amount of research outcomes. We were also able to build the research on previous research we had undertaken which we believe enriched its quality.

**Bibliography**


## Appendix 1: Project outputs to date

<table>
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<th>Type</th>
<th>Name</th>
<th>Location</th>
<th>Time</th>
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<td>4. Cell phones and Sakai - increasing access for all</td>
<td>Conference</td>
<td>Czerniewicz</td>
<td>Sakai</td>
<td>Boston, USA</td>
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<td>6. Digital inclusion and exclusion: towards elearning for all</td>
<td>Keynote address</td>
<td>Czerniewicz</td>
<td>E-Learning Update</td>
<td>Cape Town South Africa</td>
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<td>8. South African students’ ICT access and use</td>
<td>Institutional presentation</td>
<td>Czerniewicz</td>
<td>Departmental seminar</td>
<td>UFS South Africa</td>
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<td>9. Digital natives/ Digital Strangers</td>
<td>Poster</td>
<td>Brown and Czerniewicz</td>
<td>CHED research day</td>
<td>University of Cape Town</td>
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<td>11. What have ICTs got to do with it? International trends and institutional responses in Higher Education in South Africa</td>
<td>Invited presentation</td>
<td>Czerniewicz</td>
<td>Senior leadership strategic symposium</td>
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<td>Strengthening and weakening boundaries: students negotiating ICT-mediated learning</td>
<td>Book chapter</td>
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<td>Rethinking Learning for a Digital Age</td>
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