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Learning to be researchers in an e-maturity survey of Gauteng schools

Geoffrey Lautenbach
geoffl@uj.ac.za

I report on postgraduate students conducting survey research on information and communications technology (ICTs) in South African schools, focusing on the notion of e-maturity. The dual emphasis of the paper is on students' collaborative experience of the authentic research process including their experience of e-maturity within the target schools and leads to a discussion in two parts around notions of novice student research *and* e-maturity. *Fifty students, most of them practising teachers, participated collaboratively in the design and implementation of the survey. Discussion in this paper is based on the qualitative analysis of 50 research reports submitted on completion of the survey field work. I analysed the reports inductively for their content using simple* in vivo *coding techniques and structured quotations into flowing narratives to illuminate both issues. Findings show that the participatory and collaborative nature of the research process contributed markedly to the composition quality of student research reports. Student understanding of the research process through meaningful engagement in authentic field work has also greatly improved their insights into ICTs in education and the current e-maturity of participating schools.*

Keywords: authentic task; e-maturity; fieldwork; ICT; postgraduate; survey research

Introduction: postgraduate students engaging in research projects of limited scope

Problems arise when Honours degree students are expected to identify issues around a topic, identify a problem, undertake a small literature review, and then address the problem by engaging in field work and analysis of data. Students are also expected to write a brief research report but many of these reports appear contrived and do not reach the necessary depth expected from students at this level. In retrospect, it is quite a demanding task for these students in comparison to Master's degree students who have more time (and experience) to carry out these tasks. Challenges experienced by postgraduate students in South Africa have already been documented (Mouton, 2007) and a new way forward has had to be explored, especially when dealing with large numbers of students. To this end, a cohort of second-year BEd Honours students was prepared as field workers to investigate the concept of e-maturity in Gauteng Province schools using survey research methods. This paper focuses on the inductive qualitative analysis of student research essays written about this process.

E-maturity of Gauteng provincial schools

Since 2001, Information and Communications Technology (ICTs) have become more commonplace in Gauteng schools. This is due in some cases to initiatives like the GautengOnline Project which envisaged that all learners and teachers would have email and Internet access by 2005 (Dagada, 2004). This particular project aimed to improve the quality of education,

enhance the economy through improving human resources, and bridge the digital divide through improving computer literacy (Department of Education, 2004). Subsequently many schools have been provided with at least 25 networked computers in computer laboratories. However, the objectives of the project have not been fully realised. Internet connectivity remains a problem and schools are plagued by theft, lack of maintenance and support, and in some cases by the "locked door syndrome" where those in charge keep computers behind locked doors through ignorance, fear of the technology, or the inability to find and manage technically proficient educators. In 2003, the education department admitted that the process of teaching and learning was changing (White Paper on e-Education, 2003) and since then it has become increasingly important for teachers to become equipped with ICT skills. Because initial studies in this field have been conducted in largely industrialized countries, findings are not necessarily contextually relevant to developing countries. In addition, it is unknown whether substantial investments in ICTs have had any impact on standards of learning in Gauteng as there has also been no systematic investigation into the use of ICTs in Gauteng schools and the e-maturity of these schools.

E-maturity is described by the British Educational Communication and Technology Agency (BECTA, 2006) as a self review framework to evaluate a school's maturity in using ICTs. It is a plan for school improvement through ICT and assumes that ICTs can empower teachers to broaden their approaches and transform practices. The BECTA framework is comprised of eight components including *leadership and management*, *curriculum*, *learning and teaching*, *assessment*, *professional development*, *extending opportunities for learning*, *resources*, and *impact on pupil outcomes*. The survey instrument used in this research could not, however, be based on only one framework so competency standards and frameworks from the European Union, Belgium and New Zealand were also considered.

The United Nations Educational Scientific and Cultural Organization (UNESCO) also describes ICT competency standards for teachers. Khan (2008), in the foreword to the UNESCO document states that it is critical for classroom teachers to be prepared to provide their students with opportunities for learning. Teacher competencies within the UNESCO standards are defined on three levels comprising *technological literacy*, *knowledge deepening*, and *knowledge creation*, which are broken up into six more components, namely, policy and vision, curriculum and assessment, pedagogy, ICT, organization and administration, and teacher professional development. Similarities are thus apparent between the BECTA framework and UNESCO standards with frameworks from the European Union (Hogenbirk & Van De Braak, 2008), Belgium (Schreurs, 2007) and New Zealand (Marshall, 2006) confirming these similarities. The components derived from these frameworks and standards are "design principles" (Reeves, Herrington & Oliver, 2002) that were used to create the draft survey instrument in this inquiry.

Conceptualisation of the project: a design to investigate the e-maturity of Gauteng province schools

Since 2008, the BEd Honours course has included an assignment expecting students to design an instrument to evaluate e-maturity at a school. Through this authentic task (Reeves, Herrington & Oliver, 2002; Herrington, Reeves, Oliver & Woo, 2004) and later in the module, they have been exposed to the BECTA framework and the UNESCO competency standards for teachers. The concept of e-maturity was thus nothing new to students when they started their mini research project.

The first step was to obtain the "buy-in" of the students and to concretise their role as co-researchers in the project. At the first contact session, students learned how to integrate research knowledge and theory, research methodological skills, and their proficiency in their field (in this case, ICTs in Education). During the research process, students were expected to develop research and report writing skills to lay the foundation for further postgraduate studies. The research project was also seen as the ideal opportunity to *identify students as research candidates for further study* which adds another 'effective practice' to the work of Blunt (2009) on this topic. Another objective was to develop *student voice in South African higher education* (Webb, 2009) and students were made aware of the fact that their voice was encouraged to come through in their writing. This was a tall order within the limited timeframe of five months but was integrated early enough to allow students to develop their writing. To this end, research supervision as well as ongoing writing support was offered using the WebCT/Blackboard platform. In the ten formal contact sessions, students seemed inspired by the knowledge that their contribution was crucial to the success of the greater project. At contact sessions, collaborative learning was used to develop individual research skills and contribute towards the enhancement of critical thinking. Students were encouraged to enter into group discussion and formal instructivist modes of teaching were avoided. The first group session, for example, was a deconstruction of the project proposal to highlight the research problem and to contextualise the issue. Students subsequently wrote up the introductory section of their research essay describing the background to the problem, placing it within their own unique school context. This introduction and background had to be supported by an initial literature review using literature as a framework for the development of their own argumentative style of academic writing. This engagement with literature and theory also formed the basis for students' future engagement with theoretical constructs that are so sorely lacking in most postgraduate research reports (Agherdien, Henning & Van der Westhuizen, 2007).

At the second interactive workshop, the BECTA Framework was scrutinised as a heuristic in small groups. Each group was allocated one component of the framework to discuss. Each component was deconstructed and changed to more accurately reflect the unique South African context. Changes were collated and used to construct a draft survey instrument which was deconstructed once again at the next contact session by allowing students to complete it using their own school as point of reference. This authentic exercise highlighted problems with language which could lead to confusion for participants at the schools who may not necessarily be first language English speakers. Issues of language, structure, and coherence were addressed and incorporated in the instrument used in the pilot phase. In this phase, students were prepared for the field research through collaborative role play based on a variety of scenarios and provided with official documentation covering all ethical and procedural issues. This documentation included information letters to principals, permission documents from the Department of Education, and letters of consent for participants. Students were then sent off to pilot one school. Their brief was to approach principals with this documentation and to allow them to identify a suitable participant to complete the survey. They subsequently had to visit another four schools in different quintiles. The concept of quintiles needs further explanation here.

The quintile score is based on national census data within school catchment areas which includes income, level of unemployment, and level of education/literacy rate. Schools in the lower 60% (quintiles 1–3) are non fee-paying schools subsidised by the government and quintile 4 and 5 schools rely on the payment of school fees with less subsidy. Theoretically,

more funds are allocated by government to the lower quintiles. Kanjee (2009) has reported that the quintile system is effective in identifying schools at the extremes (quintiles 1 and 5) but that schools in quintiles 2 to 4 are often misidentified. One of the student researchers confirms this "*even though they were in the same quintile, the schools were vastly different in all aspects*". There is obviously a need to review the current classification of schools into quintiles but this inquiry is based on the system as it currently stands.

The cross sectional survey instrument and the sample

The survey questionnaire included biographical items and Likert scale items (4 levels) related to Leadership and Management (11 items), Curriculum (6 items), Teaching and Learning (10 items), Professional Development (3 items), Assessment (3 items), Extending Opportunities for Learning (2 items), Resources (12 items), and Impact on Learner Outcomes (4 items). An analysis of the pilot study data using PASW Statistics version 18 revealed that all survey items were reliable. Further analysis of all items from the survey sample (Cronbach's Alpha = 0.957) and the items related to each category (Cronbach's Alpha > 0.7) were deemed reliable (Amory, 2010).

A total of 220 Gauteng schools (including the pilot) were sampled with 36.4% of the schools falling into the quintile 3 category, quintile 4 (25.5 %), quintile 5 (15%), with quintile 1 and 2 making up 23.1%. Sampling has, therefore, resulted in an appropriately diverse subset of schools within the province. For a detailed account of the quantitative analysis and findings of this survey see Amory (2010).

Findings and discussion around the notion of e-maturity

Novice student researchers all admitted to discovering issues in the field of ICTs in education that they had not considered before embarking on the research project. In this section I will elaborate on some of these issues using *direct quotations* from the research reports submitted at the end of the research project. As part of the report, students were tasked to write up an account of their experiences at the schools and urged to adopt a narrative style to tell the story of their visits. The stories had to be narratively-rich (Clandinin & Connelly, 2000) and were assessed for language, writing style, logical flow, coherence, and technical issues. In the following section, I present the story-telling as "a reciprocal event" (Riessman, 2002:701) between the story-teller (the report writer in this case) and myself, weaving the quotations into a logical and flowing story.

Starting with the notion of e-maturity, it is appropriate to begin with a few perspectives to provide some context around the variety of schools in the Gauteng Province and other factors that may impact on e-maturity in these schools. It is evident from some research reports that things that are normally taken for granted in some schools, like wearing school uniforms or even following a timetable, may not be a reality in some Gauteng schools. This is evident in the following statement where the researcher intimates her disbelief that things can run so smoothly "*the participant took me to their three computer centres. Learners were in the computer centres as per school timetable working on computers and all wearing school uniform*". To put this into context, some of the schools in the lower quintiles struggle with providing learners with school uniforms and some schools run on poorly developed daily schedules/ timetables or none at all. This student researcher showed amazement at the fact that the children all had uniforms, that they were working (some schools have a poor track record in this regard), that they were following a timetable, and that they had three computer facilities.

Her concept of school life does not seem to be in line with what was evident at this school. She did not seem familiar with what she observed, once again highlighting the disparities that still exist between schools in the province.

Other issues that are perhaps more important to the immediate needs of the community than ICTs in education are also highlighted: "*the informal settlements have no electricity, no drainage systems and they survive by gathering wood to make fire and cook. Most learners are poor and depend on the government nutrition scheme*". Another report mentions that "*learners depend on the feeding scheme and the vegetable garden at the school*". Despite the issue of food, other basic amenities are also lacking and impact on teaching and learning in some schools; "*a special effort was made to electrify the school but there is no telephone line. The principal communicates with the world through her cell phone*". Electricity and sanitation are the two most commonly mentioned factors that are a higher priority than ICTs for some schools. On the other hand, even having access to electricity is no guarantee that ICTs can and will be used for teaching and learning. One report mentions that "*the school is regularly faced with power failures due to cable theft*". The theft of cables containing copper directly impacts on the supply of electricity to these schools.

Discipline and other disruptive elements also impact on e-maturity in direct or sometimes indirect ways. The issue of discipline (or lack of) at some schools is evident in the comment "*the majority of them* (children) *were outside the classroom which is a common culture in most township schools*". In this case one wonders whether ICTs can have any real effect on teaching and learning if children are not even in the classroom during the school day. In some cases, there is an attempt to address issues of discipline but the methods used are also questionable. One student field worker reports "*I was welcomed by learners who were late for school. They were locked outside. Some were gambling and two boys were smoking at the gate, I was very disappointed*". Locking children outside the school was obviously not the solution to the problem in this case.

Besides issues of discipline, petty crime and theft are also regularly mentioned in the student research reports. On a more positive note, however, it can be said that the research reports also mention schools where all of these issues are well under control and where ICTs are implemented for teaching and learning. The first striking issue that is commonly identified in most of the research reports is the mention of the diversity in availability of ICTs. Schools ranged from institutions with few computers used for administrative purposes only "*the Internet is only available in the principal's office and only he and his two deputies have access to it*" to schools with multiple networked computer facilities with Internet connectivity and other educational technologies. A common tendency in the reports is the description of schools with large learner numbers and a single computer laboratory (normally 25 networked computers provided by the GautengOnline project). In some schools the GautengOnline centres are functional but in others the situation is not so good "*the lab lasted just six months as the school could not afford maintenance from the lack of subsidy money*". Students also had the opportunity to see how some schools are dealing with these issues first hand. It seems that not all schools in Gauteng are sitting back waiting for hand-outs as it appears that some schools are pro-actively taking the initiative to find alternative sources of ICTs "*he* (the principal) *showed me a copy of a proposal that they have sent to a company for the sponsorship of another computer centre at the school*". Other schools have also developed strategic plans and partnerships to improve their situations "*all educators have had basic computer skills training which empowers them to take their learners to the labs according to the timetables*".

By seeing the reality of the situation and how others are addressing the issues, most novice

researchers have been provided with some ideas that they claim will help them to address similar issues in their own schools and the communities in which they work. Some schools, for example, are taking teaching and learning beyond the school walls: "*the school is a quintile 1 school but it is making quite an impact in the community through their partnership in another school in the region where they offer computer literacy to the community*" whereas others have gone a step further "*the school has twinned with a school in Germany and the learners have collaborated with the German learners now for five years*".

Exposure to reality has, therefore, been a truly enlightening experience for most students and has helped to clear up some common misconceptions about ICTs in Gauteng schools. For example, it became apparent from the reports that not all computer facilities were provided by the much maligned GautengOnline project "*the school has five computer centres which are not from the GautengOnline initiative*" and "*the school has two well equipped computer labs, one from GautengOnline and the other developed and sponsored by a local company (networked with 50 workstations)*". It is also evident from the research reports that not all feedback about the GautengOnline project is negative and that student researchers have now been exposed to both sides of the story. According to a principal, on a positive note "*the first lab was burgled and all computers stolen but the lab has been set up for a second time by GautengOnline*". Another researcher reports "*both computer centres are fully functional but it is only the GautengOnline centre which has internet connectivity*". Student researchers have also been exposed to the more positive aspects of dealing with ICTs in education and now see themselves as a step above the other teachers who still refrain from using them in the teaching and learning process. Some have even reported cases where there was great pride in being tasked to manage the ICTs at a school "*he enthusiastically introduced himself as one of the GautengOnline* ***super-teachers*** *nominated to manage the lab*". In fact, pride and empowerment emerge as dominant themes in the analysis of the research reports.

There is still a lot of talk in the research reports about using ICTs for *basic computer literacy* but in some cases student researchers identified schools where ICTs are used in teaching and learning "*each educator is responsible for taking their learners to the lab according to the school timetable*". It is encouraging to hear about subject teachers using ICTs but this is, however, also hampered by individual teacher skill levels "*the fact that very few educators have access to personal computers also brings about challenges of its own*". Students have seen for themselves that simply having access to ICTs does not necessarily ensure that teaching and learning actually takes place.

In this paper I have purposely not focused on specific issues that may also impact on how ICTs are integrated into teaching and learning as many of these issues have been identified in other research. These issues include *school climate and health* (Pretorius & DeVilliers, 2009), *teacher identity* (Smit & Fritz, 2008), *teacher stress* (Schulze & Steyn, 2007), and other issues like *teacher motivation*, and *job satisfaction*. I argue that these issues, although not specifically mentioned in some cases, have been subsumed into the above discussion points and that it is unnecessary to unpack them further at this time. The one disturbing trend identified from the reports that I feel deserves some elaboration, however, is the issue of *teacher absenteeism*. The impact of HIV and AIDS on South African educators has already been reported in previous studies (see Louw, Shisana, Pelzer & Zungu, 2009) and this factor is clearly visible in the many reports from the field workers. In the course of this survey many field workers had to return to the schools a number of times to see teachers who were absent from their posts due to "ill health". In their reports, students identify this issue but do not address it in enough depth to

substantiate further discussion here.

The abovementioned observations all impact on the e-maturity of Gauteng schools and merely serve to illuminate specific issues from the student research reports. The discussion that follows will now specifically deal with the notion of students as field workers in an authentic research project.

Findings and discussion around the research process

The use of postgraduate students as field workers in this project led to some interesting perspectives on the research process itself. Exposure to the realities of research exposed them to realities of teaching and learning with ICTs for the first time in some cases. Book knowledge became a reality to them. For this reason alone, the authentic task has proven to be meaningful. Furthermore, the collaborative and participatory nature of the process has contributed markedly to composition quality of the individual research reports. These reports show visible improvement in technical and structural issues of logic and flow, general understanding of the research process, and a general improvement of academic language proficiency compared to previous cohorts.

Some student researchers admitted that the research project as it stands "*fosters collaborative interaction*". By making students part of the collaborative development of the instrument they could take ownership of the document and "*work from a position of authority*". One student comments "*my involvement in the development of the instrument provided me with the tools to conduct a meaningful survey at the schools*". Others concur that "*it was good to work within a well planned and monitored environment*". Regarding the instrument itself, student researchers were confident that the survey instrument was understandable to participants who were largely not first language English speakers "*all items in the questionnaire seemed to be clear to the participant, as she did not ask for any clarity*". Even though the survey instrument had been reduced to two pages, some reported that "*respondents found the survey forms too long*". In general however, this was not the case and a possible answer was provided "*they were lazy to answer the questions but I persuaded them*". Training provided during contact sessions in preparation for individual cases of this nature seems to have prepared students well for these realities.

The interactive, practical sessions on how to deal with diversity at the schools seems to have been a contributing factor to overall student success in the field. One researcher noted "*the principals were all uniquely different and each of them had their own perceptions of ICT and the integration thereof*". Accordingly, the reception at the individual schools was characterised by perceptions ranging from curiosity to suspicion "*the principal was curious and inquired about the intentions of the research and what will be done with the findings*". Suspicion was a more commonly reported issue, sometimes indirectly "*when requesting to see the computer facilities the deputy principal replied that the principal never mentioned that I will check the laboratory and if I want to check the centres I will first have to speak to him again*" and sometimes more directly "*they become very suspicious of you as if you are invading their privacy*" and "*he became very suspicious that I wanted to spy on his school*". One student provides her perspective on this matter saying "*they think that whatever you ask will be reported to the districts and cause trouble for them*". Another principal was extremely unsettled and suspicious "*she asked what would happen if the Department of Education became aware that they were not using their computer lab*". These findings highlight disturbing issues of power and control that demand further investigation in future research.

In general, student researchers felt well equipped by the support and collaborative nature of the research process. They claim that even though they had been prepared for most eventualities "*approaching participants was not a simple task*". Despite this, the atmosphere at most participating schools was reported to be generally welcoming "*the mood was relaxed for discussion and I felt warmly welcomed at the school*". Some schools went out of their way to accommodate field workers and where students used skills learned and practiced at contact sessions they were even able to change the situation to their own advantage "*the principal then offered us his office to use for completion of the survey*".

Despite many positive issues, frustrations also emerged from the reports. One student mentions her frustration at being badly treated and rushed to complete the survey form even though she had made arrangements in advance "*I felt badly treated as I had made an appointment*" In one case, the principal was not available, the deputy was busy, and the receptionist took the survey forms and letters of consent for the participant. The participant was subsequently ill, the forms lost, and new forms had to be provided and completed by another participant two days later. Others concur "*they could not complete the information on that particular day so I had to come the following day*" and "*it took a week for the school to organise the interview*". Another student reports a two-week delay. At the schools, many field workers were made to wait for long periods, sometimes up to a few days, to get someone at the school to complete the survey instrument "*she did not want me to talk to them on that day*" and "*he asked me if it was possible to leave the form with him and collect it the next day*". Despite this frustration, some persevered "*it was annoying when he asked me to come back the next day but I had to as I was the one who needed his help"*. On the other hand, by following simple protocols learned during the contact sessions some student researchers managed to sidestep these issues "*the reception there was heart-warming; they were expecting me because I had set an appointment telephonically*" and "*they were briefed telephonically and he* (the principal) *and the nominated participant voluntarily collected the survey form from the district office*". One student researchers adds "*one has to learn that it is important to be patient and not to expect every situation to run smoothly*".

Schools, like most organisations, have their own internal politics that played a role during site visits. Despite being prepared for most eventualities, students were still exposed to issues that could not have been foreseen. For example, many schools showed busy schedules that were further hampered by issues of power and unnecessary protocols "*she told me that the district people were coming the following day and that all educators were still busy preparing their files*" and "*The reception was sombre with the principal mistaking me for someone they were expecting to assess their implementation of the Integrated Quality Management System (IQMS)*". These cases highlight the plight of teachers with a heavy administrative load. Many teachers express feelings of helplessness as a result of being swamped with administrative work and (disturbingly) report that "*the best way to get on with life in the schools is to leave things as they are*". In the entire research process, only one principal refused to allow the survey to continue at his school "*he told me that his school is not going to participate as the Department of Education had failed them with regard to ICTs*". In some way he must have felt that this was how he could fight back and show his discontent with the system that had failed him. Once again the researcher showed enough insight to discontinue research at that school and continue elsewhere, supported by knowledge gained at the contact sessions and a good amount of common sense.

Despite being well prepared for most eventualities at the schools, novice researchers were

often faced with difficult questions and high expectations from principals and staff. The highest expectation is illustrated in "*I hope the research will help the school to become one of the top schools in South Africa*". Other schools used the opportunity to demand some sort of compensation and truly believed that they deserved some kind of help. The culture of expecting things to be provided is evidenced in "*will the school receive software from the Department of Education*?" and "*when will the Department of Education start providing educators with laptops*?". In some cases, however, the expectations were more realistic and less demanding "*The principal said that he hoped that the Department of Education will soon provide more ICT resources and train staff members on the use of ICTs*". One comment that may be realised in the near future as a result of the larger research project is "*I hope this survey will change the situation at our schools*".

Students report that they have had the opportunity to bring some excitement to individual schools. The research reports concur and principals and staff at these schools are unanimous in their satisfaction "*the school is excited about participating in the research*". In one case it was reported that "*the principal expressed words of gratitude and appreciation for choosing his school and exposing him to the research situation for the first time*". Another principal welcomed the initiative and invited further research at his school "*he went on to say that if there was a need for us to come back to the school we will be welcomed*". It is also evident that it is not only researchers who have benefited from the research process but that it has also been a learning process for participants: "*she was delighted to participate in the research and said that she had gained a lot of ideas on the integration of ICTs into the curriculum*". The potential for research to provide new insights to the schools is thus apparent.

Many students found the experience of being involved in an authentic research project to be empowering "*it was a great feeling to conduct research at this school as one was treated with great respect and the school appreciated being part of the process*" and "*they treated me with respect and I felt as if I was coming from the president's office*". This empowerment, however, is only possible if researchers are prepared for any eventualities and provided with basic skills and techniques needed to carry out the survey. One summed this up very well by saying "*you have to feel like a researcher to be a researcher*". Empowerment led to excitement which was enhanced by the good treatment that most researchers experienced "*I was also excited in the process because of the way I was treated*". Another student reports that no matter how well prepared you are as a researcher there will always be that small element of fear "*I had mixed feelings, I was excited but at the same time I was scared of how the principal and participant would react to my requests*". A few students concur that the experience of doing actual "real" research is much more meaningful than just writing about the research process "*I have gained both knowledge and experience through conducting this research*". It is also evident that incidental learning has taken place and that this would not have happened in an artificial research setting "*one has to be patient, friendly and polite at all times*" and "*you must be adaptable to any situation*".

In conclusion, the power of engagement as a researcher in an authentic research project is evidenced in the following statement "*I have learned more in those five visits to the schools about ICTs and research in general than ever before*". In general, the research experience can also be summed up in the comment "*the visits to the schools as a researcher have really been a truly worthwhile experience*" but for me as researcher and supervisor the true satisfaction lies in the new found beliefs and attitudes that have emerged in these novice researchers.

The way forward

Looking back on the process documented in this paper, it is now appropriate to explore the activities of the student researchers within a structured theoretical framework. There are two frameworks that have the potential to address many of the issues identified in the preceding qualitative account of novice field work and a follow-up to this paper will, therefore, elaborate on these two frameworks. The notion of *authentic activities* (Reeves, Herrington & Oliver, 2002; Herrington, Reeves, Oliver & Woo, 2004), for example, addresses issues like real world relevance, allowing for multiple interpretations and perspectives, the investigation of complex tasks over a sustained period of time, collaboration, and reflection to name but a few. *Cultural Historical and Activity Theory* or CHAT (Engeström, 1987) will be the appropriate lens to illuminate issues of power that manifest at various levels within the activity system. CHAT offers three levels at which power issues can be investigated, including vertical hegemonies (hierarchical), horizontal divisions (where individuals exert more control within a group or community), and managerial power issues that include the rules of engagement. Both frameworks and the discussion that arises from their use will then allow me as supervisor to create research activities that impact on student engagement during the field work and writing phases of the research, and ultimately on the quality of the research reports that are submitted by these novice researchers.

References

Agherdien N, Henning E & Van Der Westhuizen D 2007. Towards theoretical emancipation in Educational ICT studies. *Education as Change*, 11:17-32.

Amory A 2010. Use of Information and Communication Technology in Teaching, Learning and Administration in the Gauteng Department of Education, South Africa. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2010,* 39-46, Chesapeake, VA: AACE.

BECTA 2006. *What is the self-review framework*? Available at http://www.kented.org.uk/NGfL/ict/srf/docs/what_is_selfreview-framework.pdf. Accessed 13 March 2010.

Blunt RJS 2009. Research supervisors' perceptions of effective practices for selecting successful research candidates. *South African Journal of Higher Education*, 23:852-864.

Clandinin DJ & Connelly FM 2000. *Narrative Inquiry: Experience and story in qualitative research*. San Francisco, CA: Jossey-Bass Inc.

Dagada R 2004. Educator competence in integrating computers for teaching and learning within the framework of the GautengOnline project. Unpublished MEd dissertation. University of Johannesburg.

Department of Education 2004. *White paper on e-education. Transforming learning and teaching through Information and Communication Technology*. Pretoria: Government Printer.

Engeström Y 1987. *Learning by expanding: An activity-theoretical approach to developmental research*. Helsinki: Orienta-Konsultit.

Herrington J, Reeves TC, Oliver R & Woo Y 2004. Designing authentic activities in web based courses. *Journal of Computing in Higher Education*, 16:3-29.

Hogenbirk P & Van De Braak P 2008. ICT action school development on the basis of an inspectorate assessment. *Proceedings of LYICT 2008*, Kuala Lumpur.

Kanjee A 2009. Accuracy of the poverty quintile system for classifying South African schools. Paper presented at the *2nd Monitoring and Evaluation Colloquium*, Gauteng Department of Education, Sandton, South Africa, 20 November. Available at http://www.hsrc.ac.za/research/output/outputDocuments/6124_Kanjee-AccuracyofpovertyquintileIpdf. Accessed 9 March 2010.

Khan 2008. *Foreword to the ICT competency standards for teachers. Policy framework, competency*

standards, modules and implementation guidelines. Available at http://cst.unesco-ci.org/sires/projects/cst/default.aspx. Accessed 24 January 2010.

Louw J, Shisana O, Pelzer K & Zungu N 2009. Examining the impact of HIV & AIDS on South African educators. *South African Journal of Education*, 29:205-217.

Marshall S 2006. *E-Learning maturity model version two: New Zealand tertiary institution e-learning capability — informing and guiding e-learning architectural change and development project report*. Report to the New Zealand Ministry of Education, Wellington. Available at http://www.educationcounts.govt.nz/publications/ict/58139. Accessed 12 February 2010.

Mouton J 2007. Post-graduate studies in South Africa: Myths, misconceptions and challenges. *South African Journal of Higher Education*, 21:1078-1090.

Pretorius S & De Villiers 2009. Educators' perceptions of the school climate and health in selected primary schools. *South African Journal of Education*, 29:33-52.

Reeves TC, Herrington J & Oliver R 2002. Authentic activities and online learning. In: Goody A, Herrington J & Northcote M (eds). *Quality conversations: Research and Development in Higher Education*, 25. Jamison, ACT: HERDSA.

Riessman CK 2002. Analysis of personal narratives. In: Gubrium, JF & Holstein JA (eds). *Handbook of interview research: context and method*. Thousand Oaks, CA: Sage Publications.

Schreurs J 2007. ICT use in school: vision and performance measures. *Proceedings of the ICL Conference*. Villach. Available at https://doclib.uhasselt.be/dspace/bitstream/1942/8080/1/ICL07.pdf . Accessed 24 March 2010.

Schulze S & Steyn T 2007. Stressors in the professional lives of South African secondary school educators. *South African Journal of Education*, 27:691-707.

Smit B & Fritz E 2008. Understanding teacher identity from a symbolic interactionist perspective: two ethnographic narratives. *South African Journal of Education*, 28:91-101.

UNESCO 2008. *ICT competency standards for teachers. Policy framework, competency standards, modules and implementation guidelines*. Available at http://cst.unesco-ci.org/sires/projects/cst/default.aspx. Accessed 12 February 2010.

Webb N 2009. Muted 'voice': The writing of two groups of postgraduate geosciences students. *South African Journal of Higher Education*, 23:193-204.

Author

Geoffrey Lautenbach is Senior Lecturer in the Faculty of Education at the University of Johannesburg. His research focus includes application of cultural historical and activity theory to teaching and learning and effective use of educational technologies.