Hermann Ohlthaver – NMMU
ICT Engagement 2016

Report on Semester 1&2

September 2016

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1. Introduction

During 2016 we worked in two schools from February to June, namely Charles Duna Primary and Kama Primary. This continued in the second semester, but we also added Sandisulwazi, a rural school in Paterson in Semester two. At Sandisulwazi we engaged with eight learners on a weekly basis from July as part of a research project. At Kama Primary, we experienced some difficulty since August 2016, which will be elaborated upon in this report. As reported in our feedback regarding semester one, our interactions with Kama and Charles Duna were based upon the needs of the schools as determined after extensive consultations that were held between the respective school management teams and Prof Andre Du Plessis, Dr Ron Beyers and Preston Geswint.

2. Charles Duna Primary School – Reported by Preston Geswint

2.1 ICT Committee – ICT Plan development

The school has, as reported earlier, invested a lot of resources in acquiring ICT resources over the last few years. The main challenge identified was that the resources were not properly and optimally utilised to complement the curriculum. There has been and it is still the case, a lack of a long term vision for ICT use. One of the tasks identified this year was to assist the school in developing a long term plan for ICT integration across all facets of the school's business. In discussions with the School Management, it was agreed that and ICT committee would be established that will embark on this process of drafting a plan that would be presented to all stakeholders for their approval and adoption. A team of 4 staff members are now constituting the ICT committee. They are Mrs Nombombo (HOD and SMT representative), Mrs Oliphant (Foundation Phase representative), Ms Solwandle (Intersen Phase representative) and Mr Hlulani (Senior Phase representative).

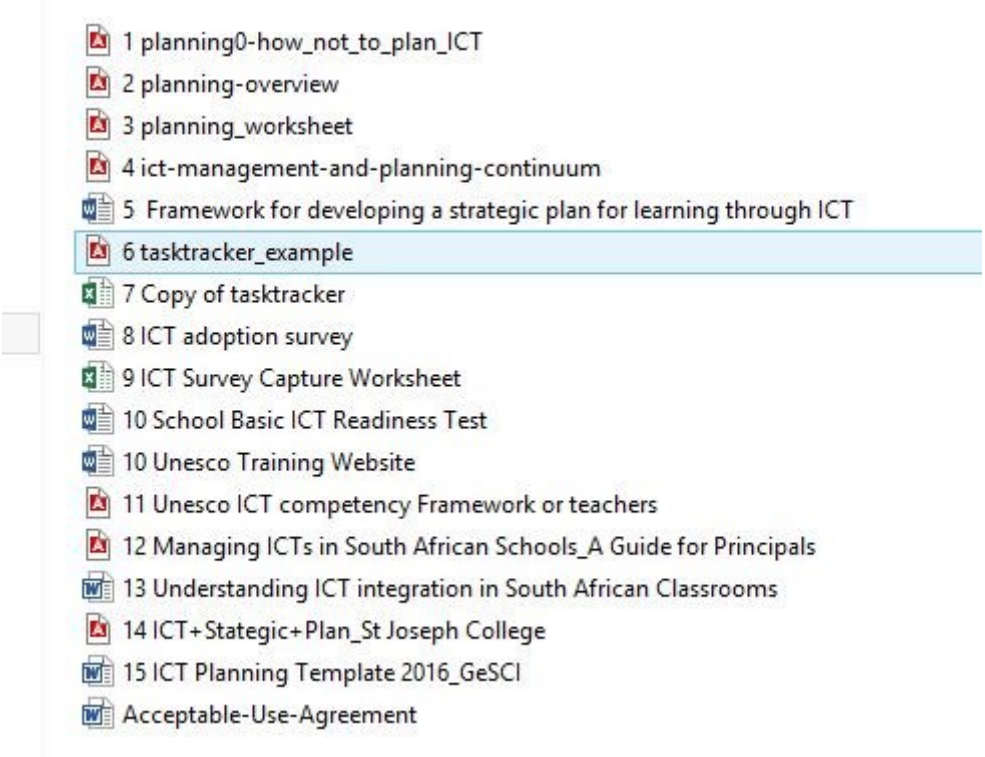
The Charles Duna ICT Committee from L to R - M. Oliphant, Ms Solwandle, Mr Hlulani and Mrs Nombombo

The committee meets once a week on Thursdays or Fridays. Their task is to consider the following:

- Develop a long term plan for ICT integration into all facets of the schools' business.
- Develop current and ongoing plan for optimising the current available ICT's. This includes drafting and maintaining a timetable for the use of the computer lab so that most learners are able to access the facility.

- Be the champions for the promotion if ICT integration among the staff and the school management.

To this end, the committee was supplied with a resource package that assists with the development of a 5-year ICT plan. During our weekly meetings we spend time looking at the various aspects of developing the plan.



ICT Planning Resource Pack used by the Charles Duna ICT committee

2.2 Ongoing work with Mathematics and Natural Science Teachers

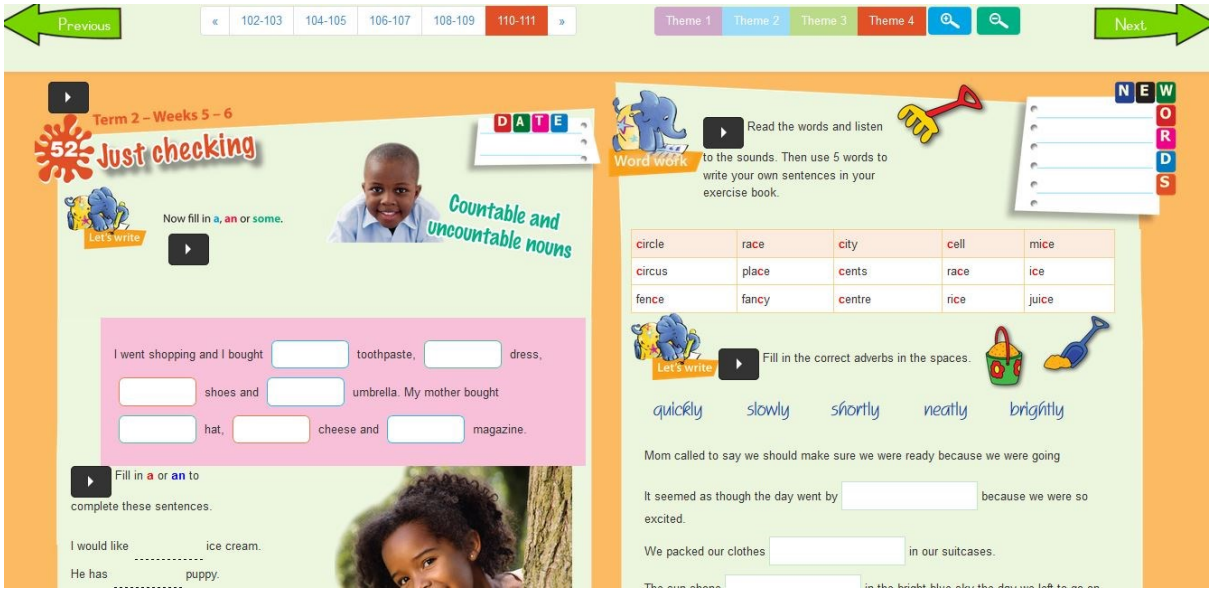
The training of five teachers in the Maths and Natural Science learning areas are on-going. As reported previously, they have learnt how to access the internet to search for and how to evaluate useful resources found. The teachers concerned are Mrs Seithshiro, Mrs Zweni and Ms Solwandle (Maths), as well as Mrs Gotyana and Ms Calana (Natural Science). The aim of the training is to collect resources that will assist the teaching and learning of science process skills required by the curriculum of maths and science. Thus far we have identified a number of useful websites for later use by teachers and learners when the computer lab is equipped with internet access[1]. Various worksheets that were collected by the teachers have been stored on the network in the computer lab. Learners will start to access these resources during the fourth term of 2016.

2.3 Assisting Charles Duna with transition to an English Medium School

The school has taken a decision to transform into an English medium school from grade 1 starting from January 2017. This was done upon request by the National Department of Education. This will be a huge undertaking and we have decided to utilise all available ICT resources to support this process.

[1] Internet access has been secured as a result of the Herman Ohlthaver Trust and will be installed in the next week or two.

This support of the transition is one of the tasks taken up by the ICT committee. This support will be focussed mainly, but not limited to the foundation phase grades of the school. All the computers are equipped with headsets which will allow us to make use of a number of interactive audio-visual software. We are evaluating a number of available resources including Omnitux which has already been loaded onto the network of the computer lab. Interactive workbooks for Mathematics and English for grades 3 and 4 have were installed in the computer lab. A trial run of these workbooks will be undertaken at the start of term 4.



2.4 Jaguar F1-Challenge

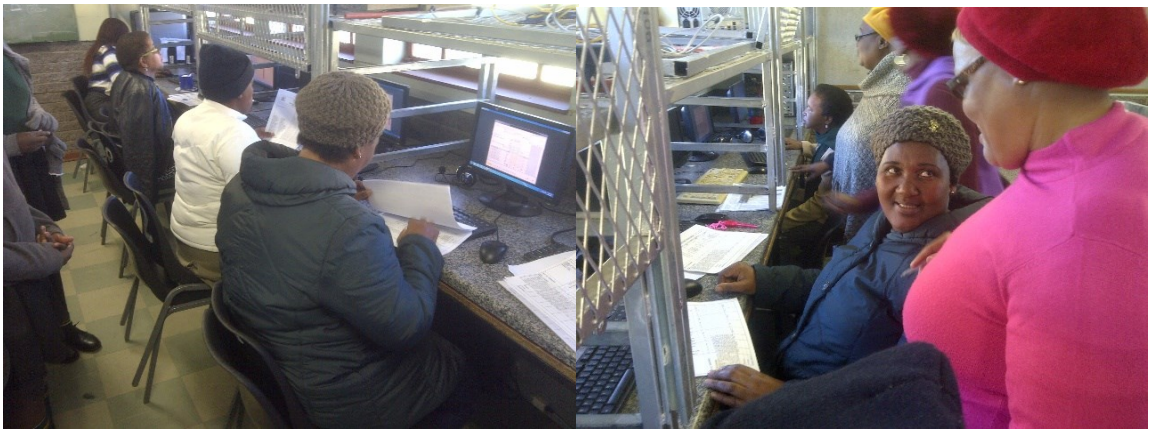
Three teams of 4 learners each have enrolled for the Jaguar (SA) F1 challenge. The aim of the competition is to design a race car built with card paper. The learners have to use design software (Silhouette Studio) to design their racing car based upon a standard template. The competition also demands that learners must present, both orally and in written (printed) form, their understanding of the design and manufacturing process. To this end they will also need good skills in word processing and presentation software. The learners are currently busy with this activity.

The Grade 6, Jaguar F1 team (above right): Lungisa Mkuhlu, Aviwe Mhlatyana, Hlumelo Mkulhlu and Slindokuhle Zana. In the above pictures they are learning the use the design software (left) and researching the principles of car design (right).

At present the learners are trained in internet research skills, as well as using the design software. The learners are investigating concepts such as “aerodynamics”, “sheer stress”, fluid dynamics” and “drag”. The regional final for the Port Elizabeth area is on 27 October 2016.

2.5 Administrative capacity of the school

We have also provided assistance to enhance the administrative capacity of the school by installing SASams (administrative database) on the networks of the administration block, as well as in the computer lab. All teachers are required to capture academic data onto the database. The teachers are receiving on-going training by the admin staff in this regard. This has improved the efficiency with which reporting are done at the end of assessment cycles in each school term.



Teachers capturing assessment marks onto the SaSams system in the computer lab network.

It has allowed the administrative staff the ability to concentrate on capturing and maintaining other critical school information such as learners' personal records, book distribution and school financial records.

2.6 German Volunteers

Charles Duna PS is one of a few schools in the New Brighton area that benefits from an ongoing sport exchange program. Apart from assisting with the sports program at the school, the volunteers are usually eager to assist with the development of computer skills of the learners. They assist with basic keyboard and mouse skills, as well as word processing and training in presentation software. The 2015/16 pair was Lukas Hack and Tieni Kröger. They worked mostly with the grade 7 learners this year.

Lukas Hack and Tieni Kröger with grade 7 learners doing word processing

2.7 Overview of progress: Intended outcomes and progress to date

During the consultation process that we reported about in our semester one feedback, it was agreed that our programme will focus on the indicated bullet points in Table 1. In the second column of the table (see next page), we indicate our progress:

Table 1: Outcomes and progress

Intended outcomes	Progress to date
Working with teachers of Mathematics, Natural Science and Technology.	• Ongoing process • Maths teachers (Grade 3 and 4) were introduced to the interactive NDBE workbook so as to allow learners to use it in the computer lab. Roll-out of this will take place in the fourth term in an organised manner (Timetable). • Science teachers will introduce learners to the GMSA Foundation website in the computer lab. Teachers are already accessing the website via tablet in classroom. Learners will then be able to access worksheets and other activities available on the website.
Assisting teachers find internet based resources that will enhance the teaching and learning of science process and design skills. After collecting and evaluating the resources, the effective deployment of these resources in the classroom will follow. The computer lab forms part of this process.	• Five teachers (NS and Mathematics) had training sessions. Teachers are able to access resources using Google searches. They can also download relevant material. They are not absolutely confident yet. More training is required. (Program disrupted when the computers in the admin block were stolen; that was used as the training venue since it had internet access. We will continue in next term when the internet is up and running in the computer lab). • The downloaded resources were transferred to the computer lab before the admin block was burgled. It is now available on the network. • Deployment of the resources into the classroom is still to follow. Only two teachers have experience in using data projectors. The maths group will need to be trained before they can make use of such resources in the classroom. The school has two data projectors and screens which can be used.
Mathematics teachers from grades 1 to 7 will be orientated in the computer lab to familiarize themselves with software such as TuxMath and Mathemagic. The aim is for all Mathematics teachers to take their own learners to the computer lab for working with the mentioned software.	• All teachers were introduced to TuxMath and Mathemagic. They had two sessions to explore the software. Grade one learners have had occasional use of TuxMath (mental maths exercises), Grade 5-7 learners have had more exposure thus far, but not on a consistent basis. - Roster issues. Teachers also still need to embrace the resource. One Grade 6 teacher takes her own class more regularly.
All teachers will be introduced to Cartoon Story Maker, a language literacy program. This program will be used by learners to practice creative writing skills.	• Only one session to introduce teachers was held. A person (Language practitioner) from the Zenex foundation, working with the school has expressed great interest and will assist the language teachers in the use of Cartoon Story maker.
Work with learners in developing science process skills using physical apparatus as well as the digital resources collected by the teachers.	• Should/will commence in term 4. Development of the roster is therefore critical. Maths and science teachers were shown how to use the downloaded material with their learners using the computer lab.
Train learners to access on-line resources (internet connection permitting).	• As soon as internet connection is available - will start with the Gr 5-7 learners in conjunction with the NS teachers. The Jaguar F1 team is being trained to access the web to research car design. They are doing well at present.
Conduct research on the impact of ICT-use by learners of grades 5 and 6 in developing scientific literacy.	• Shelved for now.
Assist the school in developing a roster for use of the computer lab in conjunction with the lead ICT teachers.	• In the process of formalising a roster. ICT committee were tasked to assign each learner of every class a computer (numbered) during the first week of the new term. Each class teacher will indicate on a class list to which computer each learner will be assigned. Class/subject teachers will then accompany learners to the computer lab based as indicated on a roster. At present the learners of grade 5-7 have regular access to the lab for mainly basic skills training (German volunteers and some class teachers) - on an adhoc basis. Grade 1 learners had at most two sessions using TuxMaths.
Assist the school with technical maintenance of the ICT resources.	• Continuous as required: We always have to do trouble shooting of the older computers to keep it running. • Gave all learners training in the correct shut-down procedure to avoid start-up issues. • Constantly loading new software resources especially software which is directly in support of the curriculum.

2.8 New German interns

The new pair for 2016/7 that started in August is Imke Sich and Jobst König.

Imke Sich and Jobst König working with the grade 5 and 6 learners

They are continuing where the previous two left off. They have also expanded the activities to the grade 5 and 6 learners. They will also do work using the literacy software installed in support of the curriculum.

3. Kama Primary School – reported by Dr Ron Beyers

We reported as follow in our semester one report:

"*The Principal was approached by Associate Prof Du Plessis and Dr Ron Beyers to request permission to work with the school regarding ICT training. Toward the end of the term the Principal discussed the matter with his staff and indicated that they wished to have training in MS Word and Excel relating to how this can be used in the classroom. Time was spent in the computer lab to resurrect as many PCs as possible – 14 working units at the time.*

After a shaky start, training began with instructions from the principal to start with Excel as the term was drawing to an end and teachers were about to prepare mark sheets. On the 10th of May Dr Beyers arrived and started the training session with 14 teachers.

Teacher training in mouse skills at Kama Primary School

It soon became evident that some of the teachers were not computer literate at all. On enquiry, the vast majority had not touched a mouse before and training had to be customized to address this issue. For the remaining 2 hours the focus was on using the mouse to play Solitaire, Hearts and Minesweeper, as many were not comfortable with holding the mouse. This allowed time to give on-on-one attention to those who needed further instruction.

Further training is scheduled through the Principal for during the June exams."

The proposed program for semester two were as follows:

- *Mathematics, Natural Science and Technology with an emphasis on the use of the internet and other resources in the classroom*
- *All teachers will be introduced to Cartoon Story Maker to encourage learners to develop creative writing skills.*
- *Train learners to access on-line resources*
- *Conduct research on the impact of ICT-use by learners of grades 5 and 6 in developing scientific literacy (time permitting).*

Unfortunately, we have to report that we encountered severe difficulties at Kama. The newly appointed principal assisted us well during the first semester, but during semester two we could not a lot of make progress. We investigated why and the following was revealed:

- The internet connectivity that we supplied was not working and he was not happy about this. As such, whenever we made contact via cell, he did not respond with new dates for training.
- The server did not work anymore.
- Unhappiness about four computers that was refurbished software wise by us.

After another site visit in August, Dr Ron Beyers reported the above and we immediately acted. We fixed the internet connectivity (Digital Dynamics). We are in the process of fixing the server. The software issue resulted due to data issues, but it appears to be resolved. As such, we have not been able to reach our intended outcomes for semester two.

4. Sandisulwazi High School, Paterson – reported by Prof André du Plessis

In Paterson we have continued with ICT support as part of a research project. Prof Du Plessis is engaged with eight learners (one grade 10 male, four grade 10 females and three grade 11 males) on a weekly basis, as well as on some Saturdays as part of a bigger NRF project. As the Herman Ohlthaver Trust has supported Sandisulwazi last year and this year, it was decided that the NRF project, including the ICT part will involve this school. The focus of this project from my side is to assist these learners to think about their future aspirations – which include using ICTs. The importance of career development (to which I refer as aspirations) with special reference to low socio-economic black children in South Africa, have been highlighted by Watson, McMahon and Longe (2011) and Watson, McMahon, Foxcroft and Els (2010). There seems to be a paucity of information pertaining to the aspirations of rural black children (Watson *et al*., 2010, 2011). In addition, Watson (2009) suggests that qualitative research is needed instead of the predominant quantitative research for the South African context pertaining to career choices and aspirations of black children, which include rural settings. This educational qualitative engagement project is thus an attempt to promote career thinking (aspirations) among rural black youth one the one end, as well as to gain understanding and to promote thinking about the perceptions about their future aspirations in order to add to the limited existing body of knowledge pertaining to this. As such, this project as study is underpinned by the critical theory paradigmatic stance which has at heart transformation, social justice and enablement (Cohen, Manion & Morrison, 2000, p. 28). The above resulted in the phrasing of the following main research question with reference to the aspirations of black rural youth in which we are using ICTs as tools:

- How does a small group of grade 10 and 11 rural school youth envision their futures by making use of ICTs as tools and visual participatory methodology to portray their perceptions of their aspirations?

In order to answer the main research question, the following sub-questions were phrased:

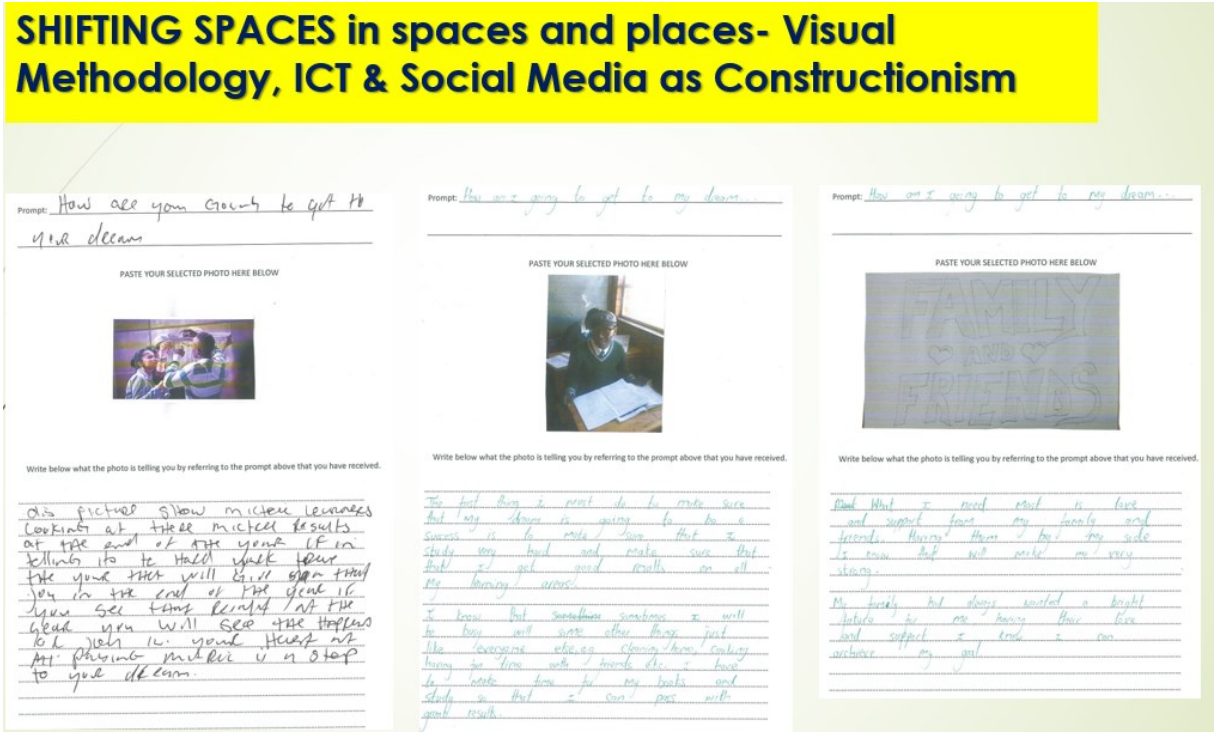
- What future perspective do the rural school youth have for themselves?
- Why do these rural youths have these aspirations?
- What keep these rural youths back from realising this future perspective?
- How can this future perspective for these rural youths be realised?

In order to enable us to do this, we engaged with these learners at least once a week from 14:00 to 17:30 at Paterson. We started in July when the learners used cell phones, tablets and laptops to take photographs based on several prompts – visual participatory methodology. The prompts were as follow:

- Draw what you want to be in five to six years from now (Your dream work)
- Take six pictures of why you want to be what you have drawn? [I want to become a ……. because …….]
- Take six pictures of what stand in your way to achieve your dream
- Take six pictures of how you can overcome these things that stand in your way

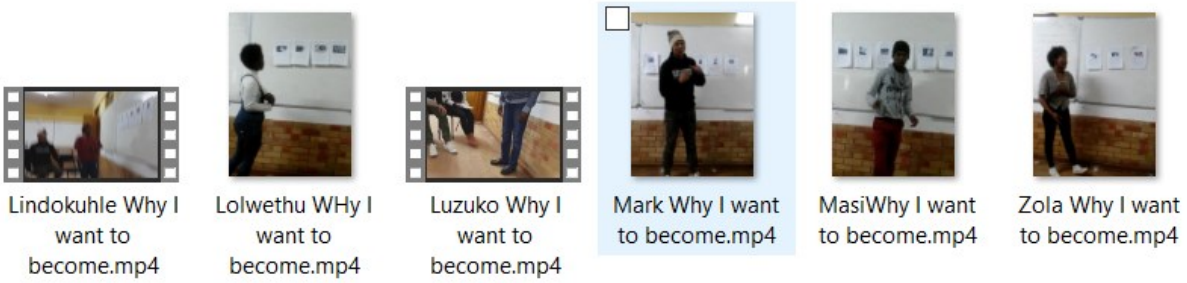
After they have taken their photos, they inserted the photo on a provided page and wrote a caption for each photo individually (see Figure 1).

Figure 1: Visual Methodology and inserted ICT cell phone and tablet photos taken by learners



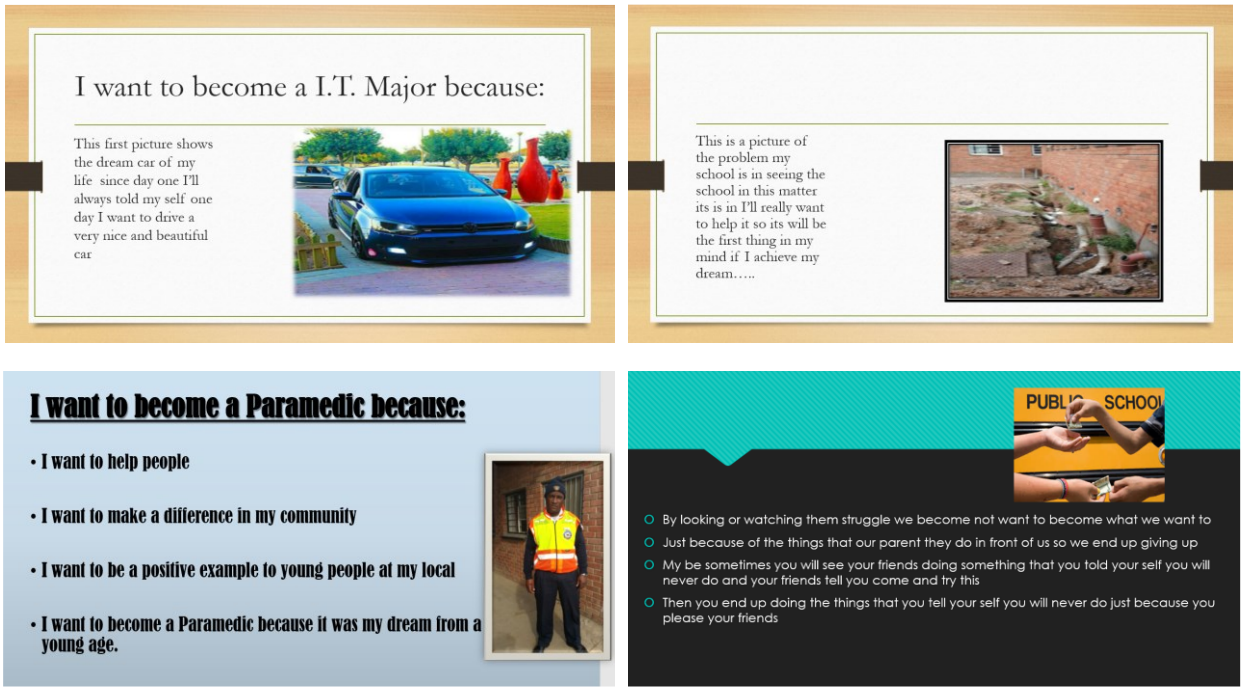
This is followed up with a presentation by each learner in front of the other learners. Each presentation is also recorded (see Figure 2) in order that they can look at their presentations afterwards and suggest how they think they can improve. This required four sessions (approximately twelve hours).

Figure 2: Video recorded files



The next step after the above was completed, was an introduction to PowerPoint. The learners were first introduced to PowerPoint, as they have never used it previously. They were taught the basic PowerPoint skills in context as part of their participation in this aspirations project. They planned their slides and assisted one another to critique each participant's slides and presentation in order to improve their work (see Figures 3 and 4). This process took quite a bit of time (approximately ten hours).

Figure 3: PowerPoint slides of the participants

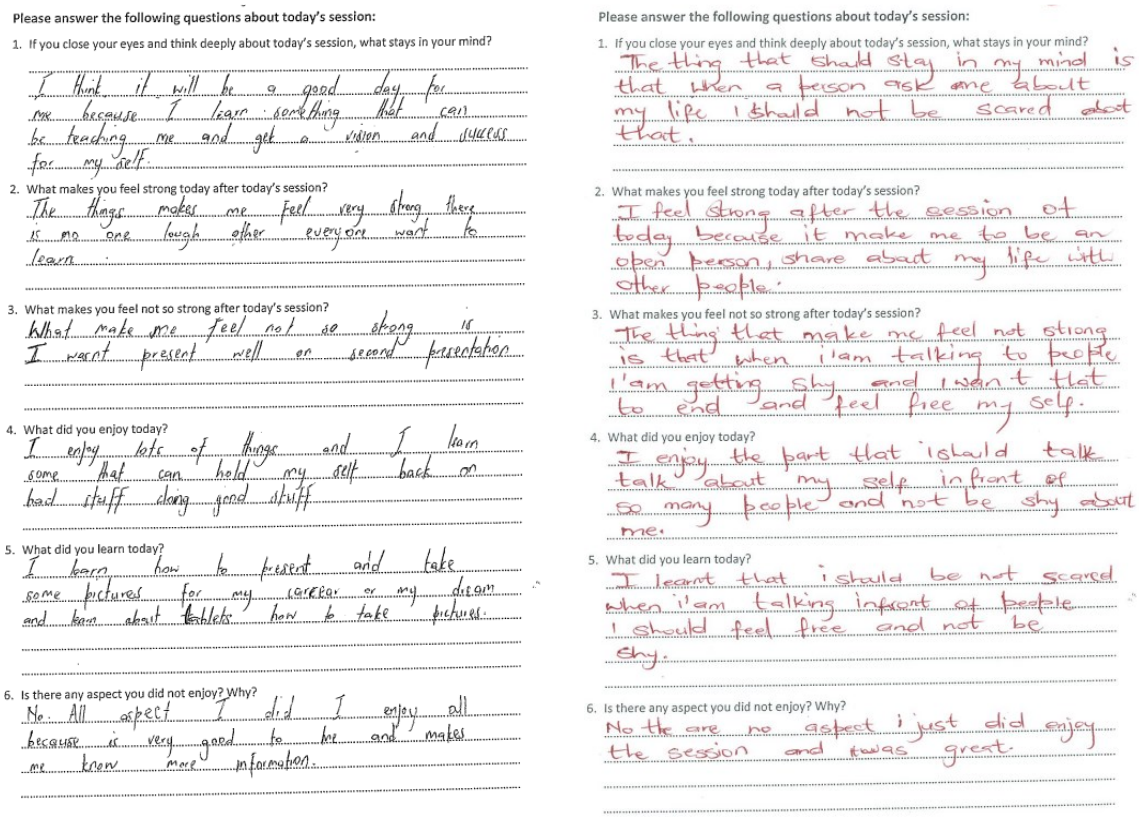


The learners work very well together and most of them learned very fast. The three who struggled were assisted by myself and two peers.

Figure 3: PowerPoint design and inserting of images

At the end of each session, the learners completed a reflection sheet (see Figure 5). The focus was not just on ICT, as the reflection sheets showed that we also addressed presentation skills and personal motivation, as some learners had mentioned that they were shy before, but felt much more confident now.

Figure 5: Reflection after a presentation session



Please answer the following questions about today's session:

1. If you close your eyes and think deeply about today's session, what stays in your mind?
   I think it will be a good day for me because I learn something that can be teaching me and get a vision and success for my self.
2. What makes you feel strong today after today's session?
   The things makes me feel very strong there is no one laugh other everyone want to learn.
3. What makes you feel not so strong after today's session?
   What make me feel not so strong is I wasn't present well on second presentation.
4. What did you enjoy today?
   I enjoy lots of things and I learn some that can hold my self back on bad stuff doing good stuff.
5. What did you learn today?
   I learn how to present and take some pictures for my career or my dream and learn about tablets how to take pictures.
6. Is there any aspect you did not enjoy? Why?
   No. All aspect I did I enjoy all because is very good to be and makes me know more information.

Please answer the following questions about today's session:

1. If you close your eyes and think deeply about today's session, what stays in your mind?
   The thing that should stay in my mind is that when a person ask me about my life I should not be scared about that.
2. What makes you feel strong today after today's session?
   I feel strong after the session of today because it make me to be an open person, share about my life with other people.
3. What makes you feel not so strong after today's session?
   The thing that make me feel not strong is that when I am talking to people I am getting shy and I want that to end and feel free my self.
4. What did you enjoy today?
   I enjoy the part that I should talk talk about my self in front of so many people and not be shy about me.
5. What did you learn today?
   I learnt that I should be not scared when I am talking infront of people I should feel free and not be shy.
6. Is there any aspect you did not enjoy? Why?
   No the are no aspect I just did enjoy the session and twas great.

The next step was to search for information on the internet and to think how one can use social media, e.g. Facebook, to make people aware of their dreams, challenges and suggestions. They have made PowerPoint slides for this two (approximately six hours).

Our next step is to invite a peer and their parents to a session where they will present their PowerPoint presentations to their parents and a peer and obtain feedback then from them. This will be followed by adding voice recording to PowerPoint which they will then publish online on Facebook on a private page and where myself and invited peers will engage further about their aspirations.

They also visited NMMU one Saturday in order to become aware of where the university is located and what it offers. They visited the Faculty of Education, Main Building, Library, Computer Labs and Registration Offices. We also gave them a campus tour of the other facilities e.g. sports fields and Indoor Sports Centre.

5. Continued internet provision

We are continuing to provide internet connectivity and support as part of the Herman Ohlthaver Trust project to the following schools, including technical support when required:

- Emafini Primary
- Emfundweni Primary

- Charles Duna Primary
- Kama Primary
- Kwamagaxki High
- Paterson High
- Malabar Primary
- Malabar High School

6. Research

Our intensive work at Sandisulwazi in 2015 with four PGCE students resulted in the publication of an academic article in an international accredited journal. An extract is inserted as an appendix and the whole paper is attached as a separate pdf file. This also indicates that the international community value what we are doing.

7. Conclusion

Despite challenges, we are proud to state that our work at Charles Duna in Port Elizabeth and at Sandisulwazi in Paterson is going well. At Charles Duna it is both teachers and learners that are benefitting from our ICT engagement and at Sandisulwazi in Paterson it is the learners. We are really excited about our Paterson project regarding these learners' explorations of their future aspirations. Our interaction with them revealed that this has been the first time while being at school that they have had an opportunity to talk about their future. If all goes according to plan, I will be making a presentation with co-workers (researchers) about this project at the end of October at the SAERA conference in Cape Town. We will continue to serve these schools in the future. We would like to thank Mr Alan Appel and the Herman Ohlthaver Trust for their highly valued support.

8. References

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9. APPENDIX A: Extract of Research Paper

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STUDENT-TEACHERS' PEDAGOGICAL BELIEFS: LEARNER-CENTRED OR TEACHER-CENTRED WHEN USING ICT IN THE SCIENCE CLASSROOM?

André du Plessis

Abstract: *This exploratory qualitative case study explored the pedagogical beliefs and classroom practice of four Post Graduate Certificate in Education (PGCE) students when they implement Information and Communication Technology (ICT) for teaching and learning, including what influences their beliefs. Data were gathered by means of a teacher belief system (TBS) tool, drawing prompts that led to individual interviews, an open-ended questionnaire, lesson plans and assessment feedback forms, short summaries of how they used the ICT resources and feedback from the method lecturer and an appointed mentor teacher. The findings suggest that there appears to be a mismatch between the participants' espoused beliefs and enacted beliefs when using ICT at this point in time. The participating student-teachers used ICT tools predominately in teacher-centred ways, yet they indicated that they held learner-centred beliefs. At the same time, this does not imply that there were no learner-centred activities during their lessons. The data seems to suggest that their exposure to teacher-centred pedagogy while being learners at school, as well as their tertiary experience could have played a role in how they taught Science. It is therefore important that lecturers model constructivist learner-centred pedagogy to students and provide opportunities for students to plan and model such practice.*

Key words: *habitus, ICT beliefs, learner-centred pedagogy, student-teacher beliefs, teacher-centred pedagogy.*

André du Plessis
Nelson Mandela Metropolitan University, South Africa

Introduction

Teachers have epistemic and pedagogical beliefs which influence how they facilitate learning (Chai, 2010). Epistemic beliefs refer to what is viewed as knowledge and how do we learn (Chai, 2010), whereas pedagogical beliefs denote teachers' *"educational beliefs about teaching and learning"*, hence how a teacher believes he/she should teach, which includes the selection of the pedagogical approach or strategy (Ertmer, 2005, p. 28).

Ertmer (2005) argues that teacher beliefs are not only extremely personal in nature, but that our previous experiences also influence beliefs, hence her argument is very similar to Kagan (1992), Pajares (1992) and Bai and Ertmer (2004), as these authors posit that previous teaching experiences could play a role in the manner that teachers teach. The implication thus seems to be that previous school experiences, as well as what prospective teachers experienced at university or college, appear to influence their practice. The above has been alluded to by Nespor (1985, p. 1) who stated that *"Teachers are thus said to have learned about teaching while they themselves were students"* and *"teachers' practices are heavily influenced by their experiences in classrooms – more so, indeed, than by their formal training."* Fives and Buehl (2012, p. 478) argue that *"beliefs act as filters, frames, or guides."* Their position is that our beliefs influence and guide practice (Fives & Buehl, 2012, p. 478) as *"Beliefs guide intention and action"* (Five & Buehl, 2012, p. 479). The implication from the above is thus that beliefs influence not only what a teacher decides to include or exclude as being important, but also how the teacher would approach the content, including his/her teaching strategy (Five & Buehl, 2012). It is thus evident that changing beliefs is not something that occurs on the spur of the moment, yet change is possible (Belland, 2009).

Kember (1997) categorises pedagogical beliefs as either being teacher-centred or student-centred. The teacher-centred position focuses on transmission or direct instruction (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurer & Sendurer, 2012, p. 427, citing Ertmer et al., 2001) where learners are mere passive listeners (Brooks & Brooks, 1999). In a teacher-centred classroom the focus is on memorization (remembering), traditional tests, the presentation of knowledge by the teacher, the completion of individual tasks, etc. which