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An investigation of the role of the training and the organizational support, in the first year of the incubation model to strengthen GIS 'incubants' (interns) in preparing them for full participation in workplace occupations: A case study of the Groen Sebenza internship project.

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By

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Supervisor: Professor Heila Lotz-Sisitka

DISCLAIMER

I hereby declare that this thesis is my own original work and has not been submitted before to any institution for assessment purposes.

Further, I have acknowledged all sources used and have cited these in the reference section.

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Signature:

ABSTRACT

An investigation of the role of the training and the organizational support, in the first year of the incubation model to strengthen and support GIS 'incubants' (interns) in preparing them for full participation in workplace occupations: A case study of the Groen Sebenza internship project.

The establishment of this study was influenced by various factors in particular by the following:-

- The concerns I encountered during my experiences as the intern/newcomer in different kinds of internship programmes in 2009 and 2012 in the Environmental/Biodiversity Sector.
- The study built a case from the challenges [i.e. the need for young, black qualified people to fill occupations that were identified as scarce skills] highlighted by the Human Science Research Council report of 2009. The context being internship programmes with the premise that there are lessons to be learnt from graduates' personal experiences in the Groen Sebenza internship project which will inform future decisions in improving the implementation of the project.
- Because the study was funded by the ATHSSETA research programme, it was further intended to help with deepening understanding of internships and how they work. It is the CATHSSETA's mandate to improve internship programmes within the sector and ensure its projects respond and contribute to the Human Resource Development Strategy (HRDS) for SA and the National Skills Development Strategy (NSDS) in the conservation or environmental sector. This I illustrated in Strategic Priority 5.2 of the HRDS (2010-2030, p. 39): "To leverage public and private sector programmes to create employment opportunities and work experience for new entrants into the labour market".

The cases in this study are embedded within a multi-layered, nested case study design. An in-depth exploration of each case is provided with a view to understand the ways in which the internship training in the incubation model strengthens the learning, experience, knowledge, skills and interest of the university graduate interns/incubants to prepare them for full participation in their communities of practice in workplaces. The Groen Sebenza

project works across more than 40 partnering organisations and uses the incubation model for the first time in the biodiversity sector which is why its training needs to be scrutinised.

To enable this aim, the research was undertaken in the context of university graduate incubants/interns in the Geographic Information System (GIS) field from the three host-organizations; Limpopo Economic Development Environment and Tourism (LEDET), Environmental Systems Research Institute (ESRI) and South African National Biodiversity Institute (SANBI). The participants of the study were purposefully selected. Data was collected twice (i.e. after the first seven months and then a follow-up interview was conducted after a further five months) during the first twelve months of the project in the form of interviews and observations. There was also ongoing data collected in the form of documents which focused on their participation in workplaces and training (e.g. questionnaire, evaluation progress report, etc.). Data was analysed using different layers of qualitative content analysis and examination of documents at different stages of the study.

Through immersion with the data and literature substantial insights were developed and emerged regarding the enablers and constraints of the training in the incubation model. These included:-

1. The twelve months period spent by the GIS incubants in the Groen Sebenza internship project was not enough to prepare them towards full participation in workplace roles and responsibilities in biodiversity occupations.
2. Internship training is not just a 'passing insignificant episode of the lives of the incubants/newcomers' [specifically those from disadvantaged communities] but is a 'real source of hope'.
3. Institutions (and their members) need to make a real effort to improve if they want to stay relevant and useful in the Groen Sebenza internship project.
4. The incubants and mentors need to make the process of reflexivity real and practical.
5. The 2.5 years incubation model has high potential to work if the institutions, the mentors and the mentees improve the challenges mentioned in the study.

Drawing from the data and literature I have discussed and recommended a model which could assist in improving the internship programmes specifically for the university students who are from underprivileged communities.

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CHAPTER 1: CONTEXTUALIZING THE RESEARCH STUDY

1. INTRODUCTION

The pursuit of this study was influenced by various factors but in particular by the concerns I encountered during my experience as an intern/newcomer in different kinds of internship programmes in 2009 and 2012 in the Environmental/Biodiversity Sector. So I begin this thesis by describing the context in which my experiences as an intern were embedded. My involvement in internship programmes contributed to the statistics of students who were trained to 'hypothetically' pursue a career in the environmental sector, it also contributed to insights about the status of newcomers specifically those from disadvantaged black communities in the biodiversity sector and affirmed some of the findings revealed by the Human Science Research Council report of 2009.

Importantly, the development of the study was made possible and by a CATHSSETA funded research programme with the aim of deepening understanding of internships and how they work. It is the CATHSSETA's mandate to improve internship programmes within the sector and ensure its projects respond and contribute to the Human Resource Development Strategy (HRDS) for SA and the National Skills Development Strategy (NSDS) in the conservation or environmental sector. This is illustrated in the Strategic Priority 5.2 of the HRDS (2010-2030, p. 39): "To leverage public and private sector programmes to create employment opportunities and work experience for new entrants into the labour market". In order to design the structure and analysis to employ I used the concept of legitimate peripheral participation by Lave and Wenger (1991). But because the Legitimate Peripheral Participation in a Community of Practice (LPP-CoP) was not a panacea for the study I added the concept of the 'capability approach' to assist in understanding data and the context of the participants. The use of LPP-CoP was relevant because it explains how newcomers in training settings gradually acquire knowledge and skills and competencies towards full participation in their communities of practice. In the title of the study I use the word 'preparation' with the understanding that the period within which I studied the Groen

Sebenza project was too short to make claims about whether 'full participation[1]' could be achieved or not. However, the duration was long enough to make claims about whether the incubants/newcomers were being adequately prepared or not.

The thesis intends to interpret how internships affect or benefit newcomers whether professionally and/or socially and/or economically in the biodiversity sector in South Africa, with the Groen Sebenza internship project used as an example. It is hoped that the newcomers' experiences which are voiced in this thesis will help decision makers in the biodiversity sector to think critically about how to plan and execute ongoing improvements in the internship programmes.

Lastly, the cases in this study are embedded within a multi-layered, nested case study design. For example, the study investigated the in-depth understanding of

- the training in the Groen Sebenza internship project,
- but because the project was adopted by several host-institutions, they also needed to be investigated,
- again within the host-institutions there were GIS communities of practice (CoP's) and
- lastly within the CoP's there were GIS incubants/newcomers who were the participants of the study and whose experiences were investigated separately and rigorously as individual cases.

The following diagram demonstrates the hierarchy and connectedness of the case studies.

[1] Full participant – core member of the practice who is experienced and competent to actively perform her role as a member.

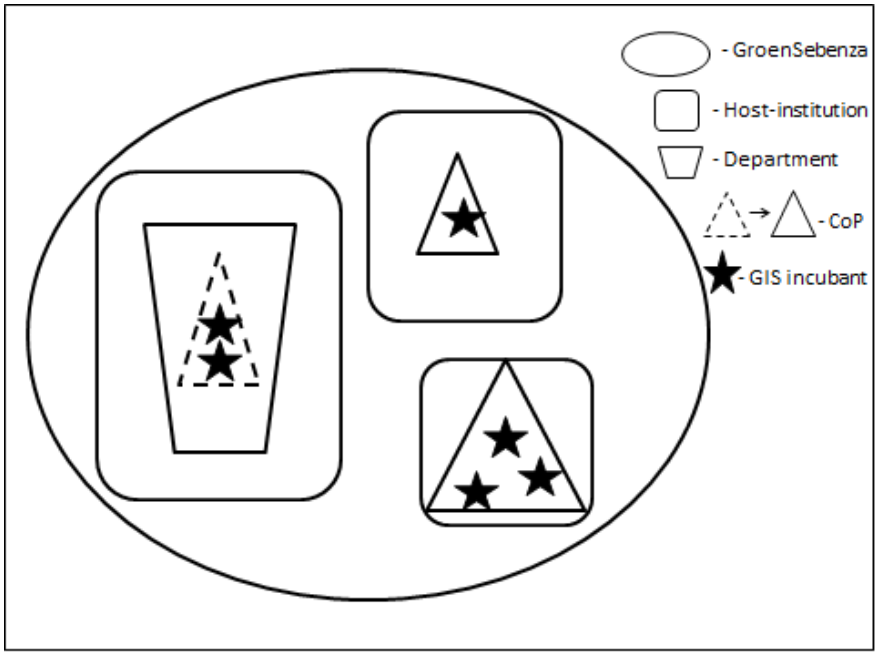


Figure 1: The sketch diagram representing the hierarchy and connectedness of the multi-layered, nested case studies of the study. The sizes and number of levels of the hierarchy of each institution was unique as were the sizes of the CoP and its recognition.

1.2. Contextualizing the study

As mentioned above one part of this study was influenced by my experience as an internship hopper. I begin this section with my story:

My career journey as an environmental scientist in the environment or biodiversity sector[2] was and still is not as clear as expected. My undergraduate education and skills acquired through experiential learning offered in the higher education institution instilled in me a sense of confidence and courage to face the work environment. This was necessary but not sufficient because the learning was constructed in a Higher Education context not in the workplace context. I moved from an environmental science internship project (i.e. SANParks[3] internship) in 2009 to a NRF-DST internship based at SANBI[4] in 2012, and I was

[2] Definitions of biodiversity and environment are different: biodiversity is the variety of living organisms inhabiting a particular space in time; and environment (usually referred to as ecology) is when those living organisms interact with each other, and non-living organisms in a particular space and time. However, biodiversity and environment in this study are treated as the same phenomenon as the institutions that study them treat them as a unit. They are not separated.

[3] SANParks – South African National Parks based at Augrabies Waterfall National Park
[4] SANBI – South African National Biodiversity Institute

already identified as a candidate for the Groen Sebenza internship before I started this study. My interest to enrol into internship programmes was fuelled by a hope that the workplace training would reveal a career path and lead to a profession I wanted to pursue. This however was not what happened as I still could not figure out what my professional strength was. Interestingly, I was not the only one going through this experience as I have confirmed similar experiences amongst other graduates [from different higher education institutions] who were enrolled in the same internships. It was difficult to fit into the necessary requirements in the environment sector market because either the level of the academic qualification was too low or we did not possess the appropriate skills. Labour market analyst, Loane Sharp, interviewed in the City Press ("Young, jobless and desperate", 2012), would argue that the path I took was good enough to prepare me for work because I had acquired the relevant education, skills and training that was required to fill the jobs in the sector. Since that did not happen with me and my colleagues from the same field, I wondered, "what was going on?"

If I was not sufficiently competent to take up jobs after graduating from university plus having acquired the completion certificates for the internship programmes, surely something was wrong. I then began to apportion blame; either myself because of my background, or the education system or the internship programmes. I could not blame the higher education institutions alone for not imparting sufficient skills and competencies to me because surely strategies such as internships were also liable, for they too are recognised as systems for skill development in South Africa. Maybe I could have worked harder and smarter. Anyway this was my experience and that of my fellow workers conversed with. Our experiences, of course, do not represent all the students who went through environmental internships for in some cases their experiences were worse than ours and in others they were better. However our experience should be of concern to decision makers in the environmental sector who are interested in skills and human development, and the implementation of quality internships. In support of the latter Flyvbjerg (2006, p. 228) drawing from Popper argued that "the invalid/insignificant number, as in scientific statistics, of people or issues in social studies is significant enough to challenge the norm and is able to stimulate further investigations and theory building" as would not be the case in the scientific realm.

Today, my learning pathway is still not that clear. However the opportunities I have chosen relating to my chosen profession have worked for me b so far but many environmental students including my fellow students were not that fortunate and instead they have diverged from the environmental field. Though I consider myself a success thus far, I still do not know what the future holds for me in the biodiversity sector.

Unlike in my career path, the environmental sector has recently made strides in assisting newcomers, especially those from disadvantaged groups, to identify careers they want to pursue in the environmental sector. For example GreenMatter has managed to better trace career pathways in the environmental sector and are continuing to do so and they have produced a book "*Explore your career options: Your b-book to help navigate through your biodiversity career options*" (GreenMatter, 2014) which is helpful for a newcomer in the biodiversity sector.

The lesson I have learned was that choosing a career pathway in the evolving environmental occupational contexts is determined by a well-planned learning pathway. Choosing a learning pathway is a process which requires both mental and practical effort (Saunders, Hamilton, Fanelli, Moya & Cain, 2013) because it does not only involve the mastery of professional qualities but it also incorporates mastery of personal or soft qualities. Also it does not involve one individual but is connected to the many people one encounters in pursuing one's path. Thus the learning pathway values all learning regardless of its source, such as hobbies (informal learning) and training courses (formal learning) (Saunders et al., 2013). Anyone can learn as they wish but as soon as they want to pursue a project or goal the learning is directed towards achieving the specific objectives. Depending on the context of the project/goal the learning can be simple or complex/complicated; or short- or long-term.

Where I am going with this phenomenon of the career and learning pathway is to argue that learning in general is given (with no boundaries) but learning with the intent to follow a specific professional career path is chosen (Martins & Hughes, 2009) and defined and it calls for the individuals who want to pursue a career to make proper preparations.

This study, however, is not only interested in how learning happens but also how training, specifically of the internships, occurs in the context of a workplace. The workplace is

regarded as a resource of learning for the "actual" occupation, (Strauss, 1987). I was interested in internship learning and training in the workplace because this is regarded as one of the means of increasing access to "real" jobs in the sector at an entry level.

The two concepts, the workplace and internship learning and training, guided my interest to explore the quality of the internship project training in the biodiversity sector initiated by the South African National Biodiversity Institute (SANBI) and Lewis Foundation, termed the Groen Sebenza internship project [which I will describe later in the thesis]. The aim was to see whether internship training serves its purpose as an educational opportunity that develops practical skills, knowledge and competencies for new entrants in the workplaces specifically in the biodiversity sector.

1.2.1. The status of Biodiversity Sector in South Africa

1.2.1.1. The influence of the green economy in the Biodiversity Sector of South Africa

The concept of a green economy has gained attention by different sectors to the extent that frameworks, action-plans and projects such as Groen Sebenza, were established in response to it (Kaggwa, Savious, & Nhamo, 2013). It has influenced the environmental consciousness and behaviors of many sectors which include politics, businesses, mining industries, etc., in South Africa beyond environmental economics (Borel-Saladin & Turok, 2013). This economy has been adopted due to the green jobs[5] it has already created. In other sectors such as the biodiversity sector it is predicted to have a high potential of creating jobs due to its prominence in many different economic activities in South Africa. This is a very important factor for a developing country like South Africa where unemployment including graduates from higher education institutions is rife.

Another reason for adopting this economy was because it is believed to require local expertise (Borel-Saladin & Turok, 2013). This again is crucial for the social development of South Africa especially as the country has the historical background of apartheid which has

[5] Green jobs - jobs that are created directly through activities that benefit the environment (and people).

left many black people excluded from economic participation in the country, university graduates included.

On the other hand a green economy like any other economy has its flaws. It is predicted that due to the adoption of a green economy many people are likely to lose their jobs, however the net effect between the green economy jobs gained (in the short-, medium- and long-term) and jobs lost might balance out (Borel-Saladin & Turok, 2013).. Besides the concern about its ability to create jobs, Borel-Saladin and Turok (2013) further raised a concern about the potential of the cost (i.e. financially) for its adoption being expensive especially in the beginning, but again that was over ruled by the fact that in the longer-term it might be cost-effective. Furthermore the United Nations Research Institute for Social Development (UNRISD) Research and Policy Brief 12 (2012) raised a concern about the social exclusion it might create for they argue that not all social groups will benefit from a green economy. They further argue that some of the roles and responsibilities of other stakeholders might benefit more than others. This is a reason why those who participate in it, such as the university graduates in this study, should be trained appropriately so that the green economy can work to their advantage.

Despite all the advantages and disadvantages of a green economy, the most important future factors for this study are to see how the biodiversity sector is going to monitor and manage the demand and supply of the green market (Borel-Saladin & Turok, 2013); how it is going to ensure equitable participation by all citizens including the newcomers (UNRISD Research and Policy Brief 12, 2012); and how it is going to monitor the quality of education and skills training to ensure that the promises that a green economy carries for the newcomers are fulfilled.

The main issues for the biodiversity sector in response to the adoption of a green economy and especially for the Groen Sebenza project, is to retain the newcomers. This includes:

(1) How it is going to sustain long-term jobs and how many will be created,

(2) The implications for the skills and knowledge and competencies of the jobs that already exist in the biodiversity sector,

(3) The implications for the training needed for the newcomers into the green economy.

This study is particularly concerned with the last question. In addition to the questions raised above, Borel-Saladin and Turok (2013) asks how the green economy is going to prevail because already in South Africa there "is the lack of a ready supply of sufficiently skilled workers" (p. 3). I found this gap an opportunity for the internship training process to exploit but only if it is planned, executed and monitored appropriately. It is then that internship training could have the potential to prepare and supply the green economy market with a skilled workforce.

1.2.1.2. Biodiversity skills in South Africa

South Africa is ranked as the third most biologically diverse country in the world (SADC, March 2014 http://www.sadc.int/issues/environment-sustainable-development/biodiversity/; Pocket guide to South Africa 2011/12). As a developing country it has an advantaged position to exploit green jobs via the emergence of a green economy. It will only be fair for this green economy to be leveraged equally and equitably by all citizens of South Africa, the young university graduates included.

As noted by the Development Bank of Southern Africa's report on Green Jobs (DBSA, 2011) and the Human Science Research Council (HRSC, 2009), there is exponential growth in the demand for biodiversity skills. The biodiversity field and wider green sector is an expanding sector which is capable of fostering South African growth and employment provided it is supported by enabling environments (Balmford et al., 2002; Agrawal & Redford, 2006; Montmasson-Clair, 2012). According to Malema and Fullard (2013) who are the managers of the Groen Sebenza internship project (a green job creation initiative in the biodiversity sector, see below), creating enabling conditions for green jobs includes attraction, access, skilling, upskilling and retention. They argue that such programmes can contribute to reducing unemployment, and especially youth unemployment, within the country.

There is a potential to strengthen green jobs development programmes through different strategies (SANBI &Lewis Foundation, 2010; Maia et al., 2011). One such strategy involves empowering the Sector Education and Training Authorities (SETA's) to respond and deliver

effectively and efficiently in areas and to issues that need attention, such as improved internship systems. The CATHSSETA for instance, is responsible for assessment (better implementation) of internships in the environmental conservation sector (CATHSSETA, 2013) and it should take internships seriously for these reasons. The green economy offers a new opportunity to explore how the internships in the sector could truly and significantly reflect improvements in the careers and lives of young people who participate in it.

Historically internships were always known as skills development initiatives, and are recognised by the National Skills Development Strategy as an important intervention to enhance work integration (NSDS III) (Department of Higher Education and Training [DHET], 2011). It is worrying that the skills produced in, and prior to training were and still are not adequate or sufficient to meet the labour market demands of the biodiversity sector (HSRC, 2009). Another problem identified is that institutions that managed to employ talented professionals in the biodiversity sector are unable to retain them (HRSC, 2009) due to a range of factors, including lack of mentorship, salary competitiveness and a poor culture of integration practice in workplaces (ibid). The concern of the study is that the objective of internships should not only be to groom graduate interns to be employable in the sector but for them to remain and succeed in it. This concern motivated the core focus of the study, which sought to examine how training assists with integration into workplace communities of practice.

In the past, candidates who were deemed to be suitable to assume positions in the environmental sector (similar to the Groen Sebenza's programme, see below) were mainly unemployed rural graduates who had been deprived of opportunities to participate in the economy and to develop the freedom to explore their capabilities (Environment Skills Summit, 2011). The reason for targeting mainly rural graduates from the underprivileged black communities was that historically the skills development in the biodiversity sector and at a professional level excluded the majority of the black population (HRSC, 2009). From the HSRC (2009) findings it was clear that sector transformation was and still is needed which should be in accordance with affirmative action imperatives and wider sector plans for transformation (Department of Environmental Affairs [DEA], 2010).

1.2.2. Description of the Groen Sebenza (GS) Job-fund Project

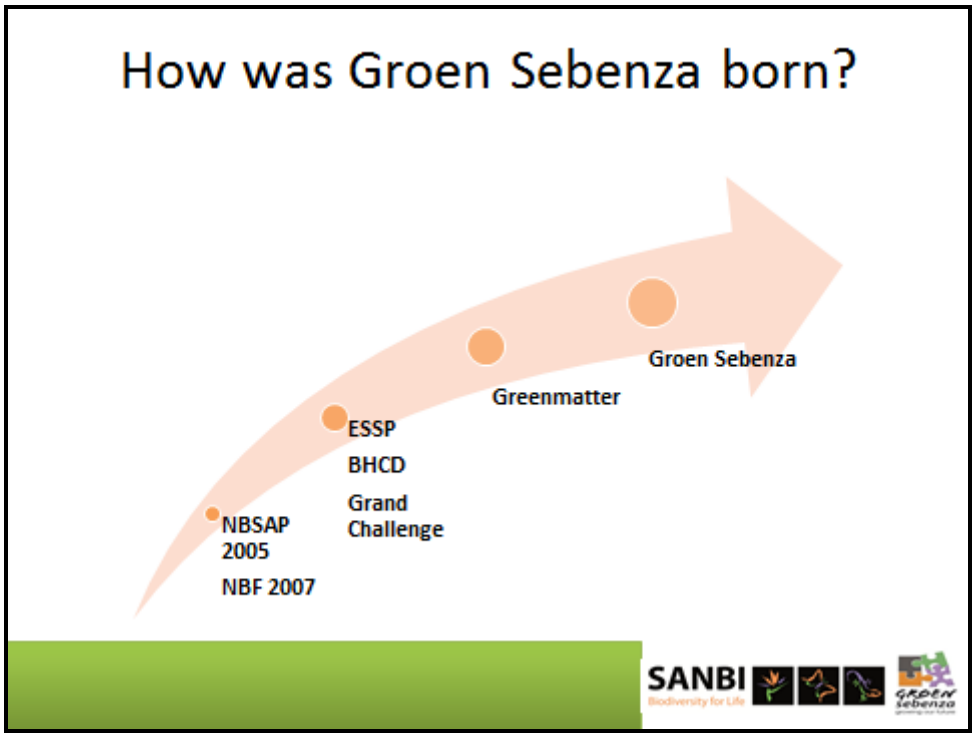


Figure 2: The summary of how Groen Sebenza project was born (Adopted from MS. Vivian Malema's presentation)

1.2.2.1. Groen Sebenza establishment

The Human Science Research Council (2009) research mentioned above was commissioned to support the development of a Biodiversity Human Capital Development Strategy (BHCDS) which, since 2010, has been implemented under the auspices of the South African National Biodiversity Institute (SANBI) and the Lewis Foundation through a programme called GreenMatter. The BHCDS (SANBI/Lewis, 2010) was envisioned to work in concert with the Environmental Sector Skill Plan (ESSP) (DEA, 2010) to address environmental education and training skills needs of young professionals (Environment Skills Summit, 2011) and to empower such individuals with skills across all levels to enhance their employability and productivity. One of the projects established in response to this call was the Groen Sebenza (jobs fund) project, which accessed funding from the jobs fund to leverage and create jobs.

The Groen Sebenza (jobs fund) project is being developed as a national pilot project to unlock green jobs to respond to BHCDS goals which are: (i) meeting the demands of priority skills in the sector and (ii) transformation of the sector. It is based on workplace learning and training (i.e. bridging into work of green jobs) as described by Malema and Fullard (2013).

Figure 3: The Groen Sebenza logo.

The word *Groen Sebenza* means "Groen" is the Afrikaans word for Green and "Sebenza" is the Nguni word for jobs, thus green jobs. The 'disjointed puzzle at the beginning and at the end symbolizes a full human-being. Also the puzzle symbolizes the bringing together of young people from across the land – to improve their employability and empower them with tools to have successful careers in the sector. Lastly the four colours used in the puzzles depict the different stages of the project. (Adopted from Ms. Vivian Malema's presentation)

It is a new national pilot study which commenced in May 2013 and will end in December 2015. The project was funded with ZAR 300 million by the Development Bank of Southern Africa (DBSA) within the Institutional Capacity Building category (Malema & Fullard, 2013). It uses a 2.5 year incubation model to facilitate access to employment in the biodiversity sector.

The project enrolled 800 "incubants[6]" with 300 matriculants and 500 graduates (by December 2013 there were 105 incubants within the age group of 30-35years, 178 incubants between 18-23 years and 442 between 24-29 years – consisting of 344 males and 383 females). The project works across more than 40 partnering organisations, and many people in the project including managers, mentors and staff in partnering organisations are using this novel model for the first time (Fullard & Malema pers. comm, 2013), which is why there was a need to investigate closely how the Groen Sebenza training enabled the

[6] Incubants = interns = pioneers, but it is the word which was preferred by the Groen Sebenza team to distinguish interns from incubants because the incubants are incubated for a longer time than interns, which is 2.5 years in comparison to a normal one year internship period. But the word incubant was later changed to pioneers. However in this study I will continue to use the word incubants or newcomers.

incubants to participate effectively and competitively in their workplace communities of practice. The intention was that the interns should remain in the sector and be placed in the participating organisations for full time employment after the internship.

Most of the planning on the 'quality' of the internship training [as a start-up] was drawn from the *Induction Workbook* for interns, mentors and organizations written by Raven and Rosenberg (2012) especially for internships in the biodiversity sector. This workbook highlights some, if not most, workplace personal and professional issues that may arise and that may need to be considered as the intern engages in activities within the biodiversity field and community of practice. Though the workbook was about internships, it did not define what the internship really was. But it did indicate that it was a structured internship which assumes experiential learning.

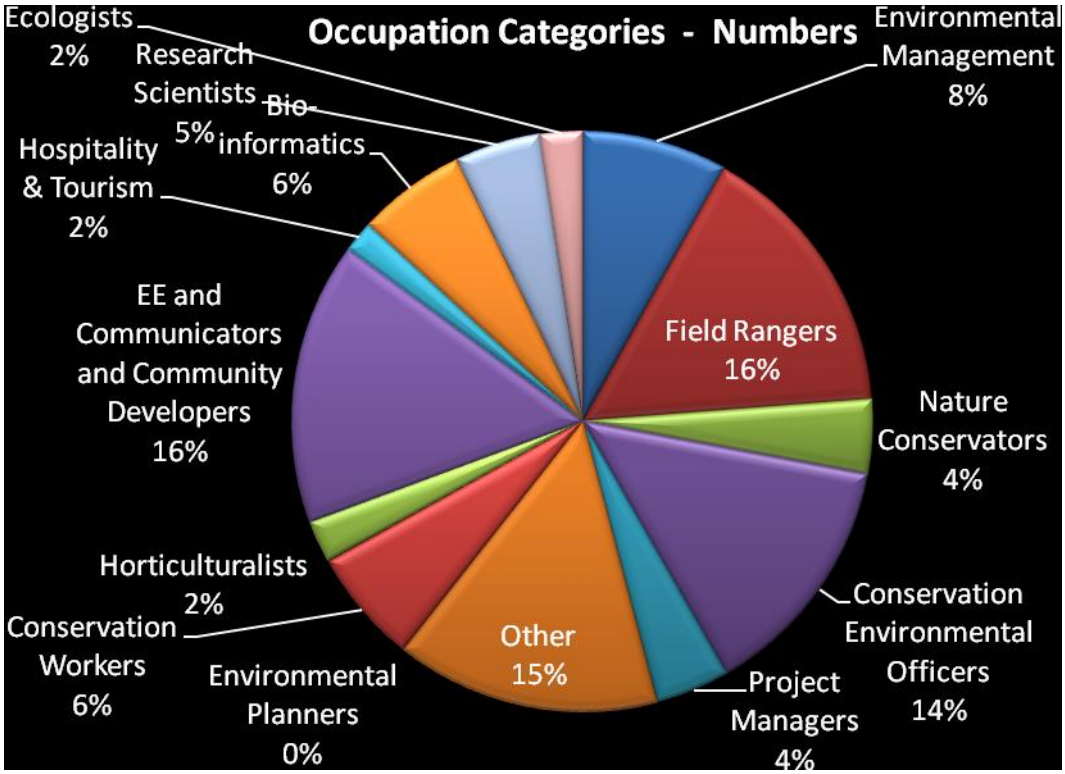
As mentioned above, the Groen Sebenza internship project used the incubation model because the period of training was longer than that of traditional internships [which usually took 8 – 12 months] and gave the incubants time and space to mature (Malema pers. comm, 2013), hence the use of the term "incubant" instead of "intern". The model consists of five key elements supporting the development of incubants: Induction, Networking, Assessment and Appraisal, Mentoring, and **Training** (I focused on training in this study). To ensure implementation efficacy, these elements were supported by task teams. I was part of one of the task teams (i.e. Induction and training task team) which focused on the planning of the training activities that needed to be conducted within the programme. However this task team later was diffused and was only called when necessary.

While the focus of this study was on Groen Sebenza internship training, the training interrelated with other key elements mentioned above. For instance while the incubants were provided training mentors too were given support through mentors' engagement workshops, and through those engagements they established networks. The training courses included non-formal and formal training and were held at the National, Regional or in-house/organizational level (Refer to study design in figure 1). The project's outcomes were based on quantitative measures (which were a DBSA priority) which required that the number of students enrolled would hopefully be the same when the project ended. To

encourage interns to stay in the sector, it was expected that permanent jobs would be created as a result of this initiative (Malema & Fullard pers. comm, 2013). Although a quantitative approach to the study was envisaged, qualitative data was introduced into the study which assisted with deeper understandings of quality and efficacy related issues in the Groen Sebenza programme, thus complementing the DBSA quantitative monitoring research.

1.2.2.2. Groen Sebenza intentions on the ground level

In addition to the intentions drawn from the HSRC report of the 2009, SANBI-CEO Dr Tanya Abrahamse (pers.comm., 2014) mentioned that the Groen Sebenza intentions on the ground were really to create jobs for young people; respond to the fact that the green sector could not find people with qualifications among the disadvantaged population; and exploit the fact that the green economy had a huge opportunity to create jobs.
The jobs the project created are illustrated in the graph below.



Graph 1: The different occupations created or filled by Groen Sebenza project. (Adopted from Ms. Vivian Malema's presentation)

In the beginning the project worked with 33 partnering organisations and the number increased to about 40 as the project was and is still gaining attention from different institutions. However the challenge the project encountered was to gain attention from private institutions (Dr Tanya Abrahamse, pers.comm, 2014). Since the project's intention was to permanently employ all the incubants this became a challenge because job security in South African government institutions was not supported. Dr. Tanya Abrahamse mentioned that they were negotiating with municipalities to absorb the Groen Sebenza incubants since municipalities were found to be potential employers for the incubants since they lacked environmental or biodiversity skilled workers and were capable of creating employment for these incubants.

Figure 4: Examples of some of the host-organizations who partnered with Groen Sebenza.

1.2.2.3. Groen Sebenza Incubation Model

The incubation model is based on a concept adopted from the business sector. There are often challenges when starting and developing an enterprise, so business incubators are there to provide support services to start-up (C.I. Com organization & IMIS, n.d., presentation). The incubation model is used by "new" business firms to outsource assistance and support that creates highly skilled, cost-effective occupations needed in the structure (Aranha, 2003; AL-Mubaraki & Busler, 2012). Its outcomes or goals concentrate on creating opportunities for entrepreneurship, jobs creation, employment, innovation and developing local economies, and technology commercialization (Centre for Strategy & Evaluation Services, 2002; AL-Mubaraki & Busler, 2012) especially or supposedly for disadvantaged groups (Lalkaka, 2001).

The success of using this model is context-related and usually its frameworks cannot be translated into the other contexts without adjustments (AL-Mubaraki & Busler, 2012). Furthermore, the central factors behind the success of this model are: (i) networking/forming partnerships, (ii) dealing with a community as a cluster not as individuals /cooperative ventures and (iii) creating consensus among partners over incubator objectives (Centre for Strategy & Evaluation Services, 2002; AL-Mubaraki & Busler, 2012; C.I. Com organization & IMIS, n.d.). However AL-Mubaraki and Busler (2012) have indicated weaknesses linked to incubator models which are the following: 1) they focus on tangible services rather than intangible services, 2) dependence on government or public funding because it may take longer for it to survive on its own (Centre for Strategy & Evaluation Services, 2002, p. 3) lack of management and qualified personnel, 4) lack of incubator planning and creativeness in solving problems, 5) uneven performance and poor sustainability (Lalkaka, 2001).

One of the issues therefore, at a broader level, is linked to the assumptions of transferring the model to a new context. This, however, was beyond the scope of this study, as I only concentrated on the training aspect of the model. There was therefore a need for critical investigation of the internship training in the incubation model the Groen Sebenza has

adopted and to see how the training contributed to the 'incubation' process. The training took place in a workplace context, and it was necessary to so see how it could "live up to its promise of being a powerful form of learning" in the workplace (Gentry & Giamartino, 1989, p. 130). Though the study was interested in the training process and how it supported learning of interns ('incubants') as they became inducted in the workplace, it was also interested in looking at the development of experience, skills and interests, in and through the training, and how this may or may not support the incubants to become full participants in their communities of practice.

1.2.2.4. What were the change indicators that the host organizations expected from the GS project?

This question helped to identify possibilities of whether the interns would succeed in becoming full participants or not. For instance, if the intentions of the host organization were to 'exploit' the interns by making them complete their workload which was behind schedule, the chances were that the interns were not going to acquire the skills, knowledge and competencies required for their prospects in the organization or in the communities of practice because the tasks may not have been planned in the best interest of their development. Edwards (2010) deepens the understanding by arguing that 'what matters' or the aspirations of the interns in the organization should be related to 'what matters' or the aspiration of the institution otherwise a conflict of interest might manifest, in which the newcomers may suffer the consequences. For example, because the conditions did not allow the newcomer to participate meaningfully in the practice, in the long run the newcomers would fail to become full participants in the practice (Lave & Wenger, 1991).

1.2.2.5. Scarce skill: Geographic Information System (GIS)/Geographic Information Science (GISc) occupations, the learning pathway and its industry

GIS skill is identified through wider sector analysis as one of the scarce skills affecting the biodiversity sector by GreenMatter and the HSRC (2009) study on human capital needs in the sector. It is regarded as a scarce skill because it is 'not available' due to shortages. Scarce skills are referred to as either 'absolute' (they don't exist in the country at all) or 'relative' – there are factors affecting the supply and recruitment of such skills. GIS practitioners fall into the category of relative scarce skills (DEA, 2010). The study focused on this skill or occupation for investigation.

I use the title 'GIS practitioner' to be inclusive of all the GIS related occupations. I did this because the environment sector in South Africa does not give clear occupations titles (with their purpose), for instance people may undertake the same job but be given different titles, or be given the same occupation title but undertake totally different tasks (HSRC, 2009). This is mirrored in the GIS field; they have GIS technologist, GIS technician, GIS officer, Spatial Analyst, Database manager and GIS specialist, in many cases they all assumed the same job and in the case of this study they did more or less the same work but it differed in purpose ('purpose' here refers to the terms of what the organization's training was intending to do with GIS practitioners).

Geographic Information Systems (GIS) or Geographic Information Science (GISc) is regarded by many Universities and other corporate institutions as one of the fastest growing fields in computer technologies. According to the GIS expert Heather Terrapon (pers. comm., 2013) who was a Groen Sebenza GIS delegate, GIS can be a useful tool for many of our socio-environmental problems and its market growth in Europe and the USA has been predicted to increase from 8%-10% per annum from 2012-2016.

GIS is the main tool used in biodiversity or conservation planning (GreenMatter, 2014). This explains why in some institutions regard GIS technician/specialist as a biodiversity/conservation/environmental planner. GIS involves the mapping and analysis of spatial data. For instance it is used in the analysis of 'real life' issues such as assessing, managing and predicting change of water use or vegetation type in an area at a particular

time or over time. Because of its multi-functional abilities and advancing technology, it is in high demand and is beneficial to many environmental occupations (refer to the table 2 and table 3a-d below for some of the occupations requiring GIS skills as pre-requisites). Thus it makes sense to many professionals, especially those who are using data that is geographically-based, to use or to start to think of using GIS tools because it saves time; it is cost-effective and user-friendly (because it can be controlled manually). But most of all, it is important for biodiversity professionals to consider using the GIS tool in order to be competent in their practice.

It has been speculated that a biodiversity professional with GIS skills has the advantage to leverage a variety of jobs at different levels in the Environmental field than in other fields. However in South Africa the GIS industry has not yet been 'strongly' formalized "like Surveying, where there is a professional body that manages it and you can get a specific degree in Surveying" (Ben Cobbling pers.comm, 2014: Director of CSS, Geographical Information Specialists).

However, there are institutions that have already started to register professionals for recognition as GIS practitioners or GIS technologists or GIS technicians. They are the Geo-Information Society of South Africa (GISSA) and the South African Council for Professional and Technical Surveyors (PLATO). Individuals are qualified to register a particular profession based of the amount of time (days or hours) they spent in GIS application/training, but under the supervision of a practising, registered and qualified GISc[7] professional. The GISc professional needs to have passed the law examination and practical test (as stated in the PLATO Registration form). There were about 130 Professional GISc practitioners, about 162 GISc Technologists, 258 GISc technicians, and 24 in training professionals registered with PLATO in 2013. But those numbers were not inclusive of all the GIS practitioners in South Africa because some of them still did not see a need for registering especially if they already had a GIS-related/GIS university qualification and were practising it (Heather Terrapon pers.comm, 2013).

Ben Cobbling (ibid) felt that this formal registration by PLATO had a long way to go "partly because GIS is a cross-study discipline; we can use GIS for pretty much anything, and as such

[7] GISc is the term used by PLATO but it basically means GIS

its roots are in a wide range of studies (geography, environmental science, cartography, urban planning, financial planning etc.)".

By cross-study discipline he suggested that anyone could be trained for the course. Whether that constrains or enables its recognition as a stand-alone profession, is yet to be determined, and is outside the scope of this study.

I conducted an internet review of the designs of the GIS courses of the Universities that the participants of the study had attended, just to get an overview of what was offered in the GIS area.

- At the University of Witwatersrand, Johannesburg, GIS studies were offered at the School of Geography, Archaeology and Environmental Studies, under the Geography Department. There was a GEOG2013 Methods, Models and GIS course that is offered as a part of Geography II; GEOG3017 Geographic Information System and Remote Sensing in Geography III; and GEOG4010 Advanced Applied Geographic Information Systems Studies offered at Honours and Master's Level. I also knew that the School of Animal, Plant and Environmental Science used to run an online GIS course for Honours students, which was self-taught but under supervision of a lecturer/tutor and on the completion of the course the student acquired a GIS certificate accredited by ESRI (Environmental Systems Research Institute) (http://www.wits.ac.za/academic/science/geography/undergraduate/geography/5683/geography_undergraduate.html extracted on the 24/11/2014)
- At the University of Kwa-Zulu Natal the GIS courses were offered in Environmental Science, in the division of GIS and Earth Observation. The website did not offer any further information (http://ses.ukzn.ac.za/GISandEartObservation/Introduction.aspx extracted on the 24/11/2014).
- The University of Venda offered GIS studies under the School of Environmental Science in the GIS Resource Centre unit. The basic/foundational course takes 10 days and it is facilitated by experts. On completion of the course, the student acquires a GIS certificate accredited by the South African Qualifications Authority (SAQA). Students are then given a project to apply GIS skills. They use the ESRI GIS software package. Anyone who is competent in the use of computer applications of Windows

MS-Word & MS-Excel, and who can pass the standard entry level could embark on the course (http://www.univen.ac.za/index.php?Entity=GIS%20Resource%20Centre extracted on the 24/11/2014).

- The University of Fort Hare offers GIS studies in the Faculty of Science and Agriculture under the School of Science and Technology - Geographic Information System. It is being taught through workshops and practical sessions at the second and third year levels as a full BSc major (http://www.ufh.ac.za/departments/gis/GIS%20Home.html extracted on the 24/11/2014).

This evidence demonstrated some of the differentiated levels of GIS skills offered and the academic disciplines offered. However there may be a limitation in the detailed information provided by the institutions on-line. This background was however, important to be considered in the internships, to understand the level at which the mentor should intervene and to understand the skills required by the newcomer.

Ben Cobbing (ibid) further stated that there were limited firms that focus specifically on core GIS in South Africa. Most of the institutions were Environmental companies or Engineering companies with GIS divisions and "much of the work is government contract work – without public projects I don't think half the GIS companies would survive. It is a reasonably tight industry".

Most training is in-house because of the different preferences of GIS software packages. At their company they "employ based upon peoples work ethic, as opposed to their specific GIS skill, and while that might be an added advantage, it is not completely necessary. In other words we don't have a set method" (Cobbing, ibid).

1.2.2.5.1. The competencies (which include technical, generic and 'soft' skills and knowledge) required for GIS occupations

Setting a benchmark of skills required for GIS was important in this case in order to see if training in GS was really working towards enabling the GIS incubants to acquire similar skills. There could be many ways to look at the skills needed for GIS jobs, however in this study I

resorted to using the following documents: the PowerPoint presentation made by GIS expert (Heather Terrapon who was a delegate for GS GIS specialist) concerning the trends of GIS skills and occupations in the local and international markets; the list of skills needs identity analysis conducted by the Groen Sebenza task team, and the GreenMatter career navigation tool which also shows the career pathway of GIS occupations in South Africa.

Table 1: The following table shows the general skills and knowledge that Terrapon (2013) recommended as useful in the GIS field.

Technical	**Generic**	**Soft**
Database management	Basic understanding of software	Attention to detail
Ability to operate GIS equipment	Proper use of grammar and spelling.	Ability to work independently
Programming and scripting languages	Oral and written language skills	Aptitude for computers
Ability to use web technologies	Understanding of how to seek out peer support to answer technical questions	Life-long learning

Table 2: The following tables (a-b) show the specific competencies (attitudes) required for the GIS professionals as per the skills needs identity analysis conducted by the Groen Sebenza task team

a) Academic background of some of the occupations requiring GIS skills as pre-requisite.

Occupation	Atmospheric Modeller	Marine Biodiversity scientist	Zoologist	Botanist	District Ecologist	Conservation officer at Interpretive	SANParks - research	Jnr Biodiversity Researcher	Junior Researcher	Air Quality Scientist
Qualification	BSc	MSc/PhD	BSc Honours/ MSc	BSc Honours	MSc	BTech	BTech	BSc Honours	BSc	BEnv.Management Honours

b) Environmental planner is the occupation that is regarded as an occupation that cannot operate without GIS. In other organizations they regard it as a GIS officer. The following list of skills is needed to assume the position.

Occupation	Environmental planner			
Life Skills	Communication	Teamwork	Conflict management	Decision making
	Negotiation	Diversity	Time management	Problem solving
	Leadership	Innovation	Job application	Looking for career opportunities
Generic Skills	Drivers licence	Data collection	Computer skills	
	Report writing	Planning	Research (registered)	
Occupation specific skills	Plant and animal ID	Conservation regulatory framework	Occupation specific operational skills	
	GIS	Environmental Ethics	Environmental risk management	
	Taxonomy	Environmental law	Alien plant management	

1.3. The Problem Statement: Research Question

The study has so far provided an overview of the processes and concepts that needed to be considered before the implementation of the internship training. These processes and concepts also feed into understanding the question that this study sought to explore:

In what way can training and the organizational support, of the incubation model strengthen the learning, experience, knowledge, skills and interest of interns/incubants to prepare them towards full participation in workplace roles and responsibilities in biodiversity occupations?

This was in the context of 12 months investigation of the 2.5 years of the incubation model. It was also in the context of university graduate incubants who were regarded as coming from disadvantaged black communities. Most (4/6) of them acquired their degrees from rural-based black universities[8].

To enable this aim, I sought to ask and explore the following objectives:-

1. What are the training-based assumptions and practices of the Groen Sebenza incubation model, and how do these relate to assumptions and practices supporting incubants to become 'full participants' in new communities of practice?
2. What experience, knowledge, skills and interests do the incubants bring to the Groen Sebenza internship programme?
3. What experience, knowledge, skills and interests do the incubants gain during the Groen Sebenza training programmes?
4. How does the training contribute/or not to the full participation of the interns in their new workplace roles and responsibilities and communities of practice?

These questions I hope will inform ongoing improvement of the internship training process with reference to how the training could help to contribute to the interns' preparation to full participation in workplace communities of practice. Perhaps this study could also

[8] Rural-based black universities – They are the Universities located within black residential areas like rural areas or locations. Historically they were built specifically for black people and located outside of main cities/towns.

contribute to the choices and retention planning of incubants in the Groen Sebenza internship programme.

Summary of the chapter: This chapter has described the context in which the Groen Sebenza project was established as well as the positions of the incubant participant within this context, i.e. the green economy, biodiversity sector, scarce skills: GIS, GIS competencies and its industry, and the need for university graduates to be full participants in the CoPs they inhabit. Furthermore this chapter has demonstrated the approaches where each feature can assist or affect the incubants' development (i.e. Research questions). The next chapter addresses the concepts underlying the research questions.

CHAPTER 2: CONCEPTUALIZING THE RESEARCH STUDY

2. Introduction

In this chapter I explain the theoretical framework and key concepts informing the interpretation and analysis in the study. Furthermore I explain how each may relate to the experiences and development of the incubants.

2.1. Training and Legitimate Peripheral Participation (LPP) in a Community of Practice (CoP)

Training in this study is not only seen as a course or the acquisition of technical skills, but also as a process incorporating a course and associated knowledge and skills into the daily activities of the interns/ incubants (i.e. in their practices and communities of practice) and where social interaction is a key aspect. In order to describe this required drawing on learning theory from workplace learning contexts. The most useful theory for this study's interest was found to be Lave and Wenger's (1991) theory of situated learning: especially their focus on legitimate peripheral participation (LPP) in communities of practice. This theory provides perspective on how newcomers learn and shape their identity [i.e. ways of belonging] as they get inducted, empowered and change in communities of practice in workplaces. They argue that it is not only the individuals who shape their identity but also the practice and participation in their community of practice. Wenger (1998a) in a later work mentions three inter-related properties that characterize the community of practice: (a) domain – shared interest, (b) community – individuals involved, and (c) practice - repertoire (Floding & Swier, 2012). This theory is appropriate for the internship study in the Groen Sebenza programme as its intention is to induct new recruits into various workplaces where they will be involved in a range of biodiversity practices (e.g. wetland management,

ecosystem assessment, GIS, conservation management, environmental education etc.).

Lave and Wenger's (1991) theory and their explanations of community of practice have been used in organizations for both individual and organizational development. I will employ it in this research because it is concerned with the following, all of which are relevant to the focus of this study:

- Most importantly to this study, the practice is viewed from the perspective of the newcomer/incubant (Lave & Wenger, 1991);
- It attempts to understand the newcomer's experiences and learning within their context and situation and how they become part of the community of practice (ibid);
- It is stated that within the community of practice, participation of members varies, hence there are central (experienced members) and peripheral members (i.e. newcomers/novices) who are brought together by a common activity or shared practice or domain of interest and are "willing" to pursue it (ibid);
- Effective participation requires continuous evaluation of needs, interests, concerns and expectations (Floding & Swier, 2012) for the newcomer to actually do the practice. It is recommended that members should have access to both social and physical resources in order to participate (Lave & Wenger, 1991);
- The tasks given to members are usually simple at the periphery but as they become motivated the degree of competence and confidence increases, the tasks then become more complex as they move to the centre (McManus & Feinstein, 2008);
- Newcomers learn from the following activities: by observing the central members, by interacting with other newcomers and central members; copying from central members, participating in activities of the community of practice; produce and reproduce what they have learned. Also, newcomers do not only learn from the community of practice they are situated in but they also learn from people outside of their community of practice (e.g. from training programmes) (ibid);
- They do not only learn job skills from central members but also how the central members conduct their lives (ibid);
- Learning is dynamic and continuous (and it is inseparable from social practices) from "active" participation in daily life activities and in social settings (Smith, 2003, 2009; Francois & Quek, 2009);

- Mentors and incubants self-evaluate and reflect on their behaviors, so that each may grow towards competencies required within a community of practice (Floding & Swier, 2012);
- Furthermore they perceive learning beyond the internalized acquisition of knowledge and ability to solve a problem. They also perceived learning as a process of increased social participation (i.e. relationships between people) which gives an individual an identity or a meaning, and ultimately brings behavioral change and better performance (Smith, 2003, 2009). Lave and Wenger (1991) also stated that "the purpose is not to learn *from* talk as a substitute for legitimate peripheral participation; it is to learn *to* talk as a key to legitimate peripheral participation" (cited in Smith, 2009).
- Last but not least, it is concerned about the social engagements within the community of practice that 'gives a proper context for learning to take place' (Lave & Wenger, 1991).

In this study I intend to investigate separately the key elements of the theory: Legitimate peripheral participation in communities of practice, according to the level of participation in the practice, those are: (a) the newcomer/incubant, (b) 'central' community of practitioners and because they pursue similar interests and goals they employ common (c) practices (see sections below). Recognizing these elements and examining them separately does not mean that the elements are not related, they are interconnected and they equally provide insight into the historical and social context of the community of practice [that give structure and meaning] (Wenger, 1998a). The purpose of separating the elements is to see the kind of knowledge produced, whether explicit or tacit, that will be useful for the reflection of training assumptions and practice in the community of practice in general and may be useful for future intervention.

2.1.1. Critiques of the concept of LPP-CoP

Just like any theory or concept, LPP-CoP also has its criticisms. Criticisms of this concept voiced by Holyoak (2013) which were relevant to this study were around the issues of power

relations. For instance it is not clear, between the mentor and mentee or co-participants or structure, whose interest is served in the distribution of learning, learning process and development process. Who makes the decision about the "practice changes in the light of new knowledge or solutions to recurrent problems"?

Nonetheless, regardless of these limitations, many researchers from different disciplines such as psychology (Holyoak, 2013), theology (Floding & Swier, 2012), business administration (van der Meer, 2013), studying peripheral workplace learning and the process of becoming a member of a CoP found it useful, and it is for these reasons I used it in this study.

2.2. Internships and Community of Practice (CoP) Theory

2.2.1. The term 'internship': its origins and use

There is also a need to describe the differences between the terms apprenticeship and internship as they are often used interchangeably. What is omitted in this comparison is the historical background and flaws of how the concept of apprenticeship was adopted in South Africa, described in detail in Wedekind (2013). I describe how the apprenticeship operates or intends to function.

Apprenticeships: This phenomenon seems to be traced to around the Middle Ages in Europe (Jackel, 2011; Wedekind, 2013). This concept in South Africa is commonly used in artisan training more than any other field (Wedekind, 2013) especially in the environmental sector. It was a training system for learners to acquire measurable competencies in a firm/organization for a particular trade or profession. Apprenticeships differed in purposes and how they were conducted. Unlike *learning* in internships where learners needed to apply theory (i.e. get hands-on experience + intellectual application) in the place of work for the career they want to pursue, learning in apprenticeships at that time was through observations of the process of work then followed by doing/reproducing what was observed

which was termed the 'natural way of learning' by Collins, Brown & Holum (1991). Lave & Wenger (1991) refer to this kind of learning as situated, they further expanded the notion by arguing that learning occurs through engaging in social processes (i.e. the activity, context and culture). Learning in apprenticeships is systematic, it has the *'structure of learning curriculum' or plan of activities or programme* because both individuals and institutions had, to some extent, to have an understanding of the 'exchange for services agreement'. And this system reinforced specific activities to be executed. Some authors such as Wedekind (2013) argue though that it was a system of slavery. On the other hand learning in internships is random; institutions/mentors do whatever they wish with the interns. The institutions instruct the intern what to do. In some instances the interns are considered 'volunteers'. The meaning of a volunteer does not necessary mean it is a bad thing, but the concern is that most of the time the volunteering activities are planned haphazardly. Volunteering is not ideal when there is a family that depends on the intern to survive or when the student has dedicated time and anticipates to be assisted to pursue a particular career. However in the end, the ideal and effective internship training requires the interns who are motivated to learn and mentors who are willing to provide support (Holyoak, 2013).

Apprenticeship like the internship can appoint candidates from one to hundreds of learners, however the difference is that in apprenticeship masters/experts need the skill of teaching whereas in the internships they need the skills of *mentoring* (refer below to the next section about mentoring).

The lifespan of service in apprenticeships used to take five to seven years depending on the contract that the learner and employer agreed upon (Jackel, 2011) while in the internships traditionally the training period is shorter usually from three months to about two years (Ash, 2009).

Another crucial feature about apprenticeships which is similar to that of the internships is that job security is generally not certain and in many cases interns/apprentices will have to look for jobs on their own. However the disadvantage for the job hunters in these cases is

that the experience of the apprenticeships in South Africa will be recognized by SAQA[9] and their training quality is monitored by the National Artisan Moderation Body (NAMB) on behalf of QCTO[10], whereas with the internships this is not the case.

Internships: As indicated above, the study is focussed on internships. It is therefore also important to understand this concept, what the working definition of this term is in South Africa, and how the Groen Sebenza project interpreted it. In this study I further discuss how the term 'internship' has been used in the past in different contexts to provide further understanding of the concept so as to better compare, and understand its relevance to the study or the thesis argument.

The literature on internship experiences is extensive (McManus & Feinstein, 2008) but many do not define what the internship is, rather they provide descriptions of internships in general (e.g. in Gentry & Giamartino, 1989). The notion of internships came from education institutions especially in the fields of business and medicine (and then later in psychology and social work), where learners were given an opportunity to try out future careers through part-time jobs (i.e. employment) or short-term training to relate the their academic training to work experience and to evaluate the nature of the learning that took place (Gentry & Giamartino, 1989; Jackel, 2011). Thus they took a formal learning and practice approach which in many cases were on the university's terms (Steyn et al., 2002). This implied that the training provided by the internships was given credits on the basis of the learner's understanding of the course in the world of work rather than 'fitness' to assume the roles of occupation trained for (McManus & Feinstein, 2008). [The purpose of the internship, in their setting, was for an 'educational course upgrading/advancing' which ultimately assisted in the leaner's academic development]. This is an important insight for this study which aims to investigate how the role of training and the interns/incubants in the Groen Sebenza internship project integrates their academic background and experiences with their training experiences and the world of work, and whether this assists them to become competent in the community of practice and become reflexive in their

[9] SAQA: South African Qualification Authority
[10] QCTO: Quality Council for Trades and Occupations

learning and development. All of this is to facilitate the interns becoming employees within the sector, as per the Groen Sebenza objectives.

As a final point about the use of internships that contrasts with what is mentioned above is that some contemporary internships are informal and have many purposes and as Gentry and Giamartino (1989) have indicated not all of them are experiential learning-based. They argue that internships can be powerful forms of experiential learning provided they have the following elements: they are applied, participative, interactive, involve a whole person emphasis, ensure contact with the environment, engage with variability and uncertainty, provide for structured exercises, involve student evaluation of the experience, and involve ongoing feedback. In addition the McManus and Feinstein (2008) review argues that the success of the internship relies on the efforts and cooperation of the mentor, intern and the organization.

I consider each of the community of practice elements introduced above in the context of the concept of internships, and in relation to the training investigation as captured in the research questions.

2.2.2. Why should the Groen Sebenza internship project or any other internship be taken seriously in South Africa?

More than anything else the South African government has committed and invested a lot of capital into internships designed for the different spheres of government agencies and their partners. For example, the DST-NRF[11] and SETAs[12] - annual government sponsored internship programmes have been running for years. These interventions by government have genuine and significant intentions for the young graduates, such as to have access to the labour market/work opportunities, make contributions to future South African economic growth (Dormehl, 2012) and support the development of leadership capacity (Raven & Stellenboom, 2014), and to redress the issue of graduate unemployment

[11] DST-NRF: Department of Science and Technology-National Research Foundation annual internship programmes (DST-NRF)
[12] SETAs: Skills Education and Training Authorities are responsible for skills development in South Africa

especially of disadvantaged black communities (Buhlungu & Metcalfe, 2001; also stated by the former President Thabo Mbeki in 2006; SANBI-CEO: Tanya Abrahamse, pers. comm, 2014) however little is known about the quality and outcomes of these internships. The monitoring system of these internships is overshadowed by the approach of only looking at the level of management and performance of institutions. Many of these internships' quality and outcomes are based on *tacit* assumptions. One of them being that they are 'always positive and valuable learning experiences' (Holyoak, 2013) and there is 'necessary' knowledge and skills transfer for the interns to take up proper jobs after completion. Another assumption is that they are known to be aligned with the career paths of young people especially graduates. However, the ambiguous aspect of these assumptions is that little is known about what and how they learn on these internships (Holyoak, 2013) which then raises a concern about whether the exchange for services intended to be delivered by internships really serves their purpose. Another challenge is that developmental opportunities for these interns are based on conjectures especially in the biodiversity sector(GreenMatter, 2013 - concept note) and it becomes difficult to evaluate their success.

This is not to say that all internships in the biodiversity sector or elsewhere are defective or inadequate, but rather to say we should be aware and take into consideration the negative myths, rumors, and perceptions around internships so that "the developmental opportunities of internships are not overlooked" (Holyoak, 2013). The fatal part of these misjudgments is if these negativities become normalized then it might be difficult to effect change (Jickling, 2013) consequently all the efforts for investing in internships could end up in vain. Furthermore, we should not be naïve and leave the warnings/absences found in other internship training (Koyana, 2014; Buhlungu & Metcalfe, 2001; Lerato T. J – Editor of TrueLove Magazine, October 2012 – The intern Agenda) unattended/untapped. The limitations/issues of why internships are not efficient and the recommendations to rectify this mentioned most recently is the "Final Report on the Internship Baseline Study – 2013 commissioned by SAGDA" must be taken into account. Again this is also not to say that South Africa is the only country in this position, even developed countries, like the USA and the UK, also experience challenges with internships. The differences between the USA and the UK and South Africa are that:

- Internships are becoming common with more articles published on them. In the few articles I searched a link between the advantages of student interns and the labour market was included (Pologeorgis, 2014), and ethical and economic concerns (Burke & Carton, 2013).
- The universities are pushing their students to undertake internships (Holyoak, 2013)
- The USA and UK has developed standard supporting and monitoring systems to monitor quality internships (European Quality Charter on Internships and Apprenticeships, 2010).

2.2.3. Critiques of internships

It should be clearly understood that I do not negate the fact that internships play an important role in the professional learning and training of graduates and that they are understood to be opportunities for graduates to gain skills, knowledge and competencies in a practice setting. However, the way the internships are advertised and articulated in South Africa, implicitly carries promises and assumptions in them (HCDS - ES, 2009-2014).

For instance the norm of assuming that all internships are experiential learning needs to be reviewed. Again I argue that even the language used in their advertisement by using words such as “capability” is exaggerated and needs to be reviewed, as thinking about this word critically is complex and often these kinds of words are misleading because we do not give ourselves time to really think rationally about what they really mean. Anne Edwards referred to them as ‘big’ words (pers.comm, 2014 – when we were having a conversation/discussion with her at the Kirstenbosch Botanical Gardens during her workshop at the University of Western Cape).

And because we use these ‘big’ words and we make so many assumptions without thinking critically about their implications, this could be why some internships do not work so well because I believe it is in the definition that determines the behaviour. This is because within a definition there is intention(s). And intention(s) according to Ajzen (1991) are made up of attitudes, norms and perceived behavioural control that determine our actual behaviour.

Again, the issue around the assessment of internships is complex. The pertinent questions that have been asked and are needed when planning or thinking of creating any internship training are the following (also influenced by my experience in internship programs):

- How are the time-frames of the skills and knowledge and competencies that need to be learnt in the internship "really" allocated? ... When and how is training success assessed to ensure that when interns exit the internship they are well equipped?
- What assumptions are tied in with the internship training especially the one that assumes that the training will give the interns a kick-start that will result in them being able manage themselves in the landscape of practice or even in the labour market (also made by the South African National Treasury (2011))?
- Are internships useful in achieving what the project/programme or organization or interns want to achieve "as a whole" e.g. skills and knowledge and competencies transfer? The meaning of 'as a whole' refers to personal, professional and organizational/sectoral growth. Or do we only focus on one part?
- Should it be a concern to see interns moving from one internship to another (internship hopping)? What are the implications thereof?
- Does merely being part of the internship training imply the success of the training? What about the employability of the interns after the internship has ended (i.e. sustainability of their livelihoods)?
- 'What matters' really, the entry into the internship or the exit from internships or both?
- Do internships serve as a strategy to safeguard the budget?
- Lastly, what is the real purpose(s) of the internship?

These are some of the questions that I considered important to take into consideration when I was investigating the GS training (in comparison to the internship trainings that I was once part of). The aim of pointing out these issues was to highlight them in order to reflect on our practices in reference to internship training as well as to interrogate the norms of how internships are perceived and practiced. This is because we cannot always assume that interns should always be responsible for the choices they make during and after the

internship training because we do not know the opportunities/chances they received in the beginning or during the training (Sen, 1997). Hence we cannot always assume the linear relationship which suggests that participating in the internship programme automatically results into empowerment of interns to become better professionals or will open opportunities for jobs, especially if we do not know what and how they are learning.

Drawing on McManus and Feinstein's (2008, p. 128) definition of the internship which they explained as a form of employment that is defined as a "carefully monitored work or service experience in which an individual has intentional learning goals and reflects actively on what he or she is learning throughout the experience". The employment described here, in another sense, can be described as that of cheap labour merely because it does not fit into the 'actual' job. However, the focus goes beyond the learner's academic development and becomes more of a 'personal or self-development' through the workplace.

The workplace then becomes a 'space' where a learner can apply his/her knowledge from school and be evaluated according to his/her internship experiences. But because it is a job, the learner is also evaluated according to job competencies. As a result, the desire for academic or personal development is gradually repressed by the organization/job expectations.

2.2.4. Mentorship, a key to the incubants/newcomers' success

Drawing on Buhlungu and Metcalfe (2001, p. 78) mentoring is defined as follows (I added the underlined text): "It is an <u>interactive relationship</u> and a set of processes where the inventive and <u>experienced person</u> offers help, guidance, advice and support <u>willingly</u> to facilitate the learning or development of a newcomer at the same time transferring skills and knowledge to the newcomer in order to <u>enhance his/her development</u>".

Drawing from that definition, mentorship then plays a vital function in the professional development of the newcomers/incubants more especially if the intention is to ensure that the newcomers/incubants gain access and fully participate in the inner circle of corporate

leadership and management in the environmental sector so as to truly bring sector transformation into effect [as the HSRC report of 2009 advocated]. This implies that the mentorship approach should not be like the contemporary ones whereby:

> Institutions regard interns as nothing more than research or student assistants … where there are no specific procedures that outline issues such as development of the intern, assessment of the intern's training, promotion, ownership of knowledge [or project] … where mentors assume no responsibility for mentoring and guiding the development of the interns. (Buhlungu & Metcalfe, 2001, p. 75)

Instead this mentorship should challenge many host institutions' norms of operating internship training. The fact that these norms need changing creates challenges for the personal and professional roles and actions of mentors, the social and psychological aspects of individuals occupying roles of mentoring in those respective institutions.

This is because the issue of sector transformation which the HSRC (2009) report addressed has been slowly embraced by the corporates and some institutions have been unwilling to embrace this transformation agenda. Many factors contribute to this resistance and among them is the issue of unwillingness of institutions or individuals to fairly equalize the opportunities for all races.

As a result there is a need for the environmental sector to employ critical changes and employ radical structural actions by breaking the *status quo* of discursive communications about the issue of providing freedom to black people[13] to equally and equitably take up management and leadership roles (or full-participation) in the environmental sector [a sector which is currently dominated by white leadership and management] (HSRC, 2009). This implies that before starting with the actual practice of mentorship there are social and psychological issues that need critical attention and which need to be addressed in advance to ensure that proper mentoring is implemented. The three major issues include how mentors and host-institutions are going to:-

- Deal with incubants/newcomers from other races, should the mentor or the institution be an unprogressive white mentor or unprogressive white dominated

[13] Black people here refers to Africans, Coloureds, Indians

institution, respectively. I do not deny the possibility of the existence of black mentors or institutions, but for the sector transformation to occur in a space where the leadership roles are dominated by whites, the relationship of blacks learning from whites is inevitable [by virtue of the whites being more experienced in the field].

According to Donald and Westphal (2013), they argue that whether intentionally or not the racial divisions due to socio-economic inequalities affect the way we perceive and treat each other. They argue that people tend to - often unconsciously – "categorize those who are different from them on either of the demographic dimensions as out-group members and those who are similar as in-group members". They are then predisposed to effortlessly help the in-group members [to the extent that even in conversations they tell 'the secret of success'] rather than the out-group members, which as a result affect the acquisition of relevant learning. And because of those classifications the out-group members will have to work very hard to impress the in-group members in order to feel part of the in-group. And often it is difficult for the out-group members to impress especially if they do not know the norms of the practice or institution. Donald and Westphal (2013) further argue that "While people show a consistent tendency to favor in-group members, they often display what Brewer called "an absence of equivalent favoritism" toward out-group members rather than viewing out-group members negatively or actively mistreating them"(p. 1175).

- Another social issue they need to deal with is the context of developing the capabilities of university graduates who are from historically underprivileged communities where poverty related issues and other socio-psychological ills are prevalent,
- Lastly, they need to deal with the same historically underprivileged university graduates who are from the Universities which are termed "rural-based black universities" [these are the Universities known to play a lesser role in the production of knowledge and production of well-equipped/well-resourced graduates].

There has been extensive research on mentorship including international research by Donald and Westphal (2013) and local research by Buhlungu and Metcalfe (2001), and Booysen (2007) which indicated that among other features of mentorship, the socio-psychological issues in mentorship are regarded as crucial to be addressed and need to be dealt with to overcome the impediments for relevant learning and the transfer of appropriate skills and knowledge and competencies anticipated in the internships. These social and psychological issues cannot be overlooked just because they are 'sensitive' and in a similar way we cannot be naive and assume that racial discrimination is completely eliminated in the sector and does not affect the learning and mentoring relationships in workplaces. Even though racial exclusionary behaviors often cannot easily be identified or even acknowledged that they exist, inherently whether psychologically and/or in our social engagements and behaviors it leaves disunities and discomforts. That is continuing to happen in South African organizations. Laws and policies in South Africa have been put in place to prevent racial-discriminations acts in organizations or even racial acts by individuals but the truth of the matter is that for true transition to happen and for the organizational culture to change it will need more than policies but requires change in the organizational culture. By change in organizational culture means it will require individuals and teams, and even CoP's and people around those organizations to change their way of thinking and behaving (Horwitz, Bowmaker-Falconer & Searll, 2006). Parker and Bradley (2004) have also spoken about the need for change in the hierarchical organizational structural thinking and behaving.

This study recognized the importance of these social and psychological features in an environmental sector, where the mentors and mentees might/might not be from different social groups in which historically the two groups bear the imprint of the legacies of social and political divisions which led to one group being considered less capable or inferior (i.e. blacks) than the other (i.e. whites). I stated "might be" because in some host-institutions the mentors were black people and it is not possible to generalize about these issues in all contexts.

According to Donald and Westphal (2013) in their '"participation process mentoring" guidance, they argued that the success of the mentees/newcomers in the internship depends on the following:-

- On the experienced mentors whom at the end hold the keys for the mentees/newcomers to learn proper and appropriate ways and behaviors needed in the field,
- Mentors need to provide information on norms for participation to newcomers, because

> In the absence of adequate participation process mentoring from an experienced mentor, newcomers would likely find it difficult to effectively learn about prevailing norms for contributing to team/department/sector deliberations. Without such mentoring, newcomers would have to rely largely on their own observations of how experienced employees participate, and it would likely be fairly difficult for newcomers to gain an accurate understanding of the "right" ways to participate exclusively through their own observations. In fact, it is relatively easy to see how newcomers might often draw the wrong conclusions from their own observations of experienced employees (Donald & Westphal, 2013, p. 1173)

- The acceptable behaviors of newcomers are "interlinked in complex ways that make the norms more difficult for newcomers to discern without mentoring" (ibid, p. 1174)
- Lastly, effective mentoring makes the appropriate ways of participation less complex which then speeds up the newcomers' ability to participate.

So far I have discussed matters concerning the social and psychological dimensions of mentorship, in the following section I discuss how the institutions can assist in mentorship. Lave and Wenger (1991) argue that if mentorship (although they do not use the word 'mentorship' as such but rather 'teach'; however their teaching involves skill transfer and learning) is structured within the participation framework of the institution/CoP, then the standard of knowledge and skill transfer should be measured according to the standard of skills and knowledge needed for the occupation in the GIS field as a whole not by the standard of conforming to institutional rules or what is required from the GIS in the institution. So it is very important for the mentors and the institution to balance these competencies.

It is also important to consider that it does not necessarily mean that if the above mentioned concerns are resolved then mentorship will demand less effort, because again not every mentoring relationship and every mentor will produce a productive or useful outcome. This is not about a "ticking a box" effort rather it is about iterative interactions. Lave and Wenger (1991) stated that for the mentors to produce effective learning does not only depend on their teaching style or their understanding of things but it also depends on how they share participation that provides growth for the newcomer.

To this point the discussion about the mentor-intern relationship appears to focus or rather appears to be dependent on the mentors' efforts however this is not entirely the intention of this discussion. The message that this mentorship discussion wants to convey is that the relationship has to be established from the foundation of empathic and mutual understanding. Both the intern and mentor need to interrogate their behaviors of learning and mentoring, respectively. Mumford (1995) in his article "Learning styles and mentoring" highlights other ways of introspection by the mentor and newcomer in order to ensure that the relationship they build bears better fruit. He deliberated different kinds of situations, problems and opportunities for different personalities (see the tabulated summary below).

Table 3: The table summarizes the learning styles (or different personalities) that the individual can use to understand their behaviors or the behaviors of others and be able to apply them in different situations, problems and opportunities (drawn from Mumford (1995)).

Activists	**Reflectors**	**Theorists**	**Pragmatists**
They try anything once; tend to revel in short-term crisis, firefighting; tend to thrive on the challenge of new experiences; are relatively bored with implementation and longer-term consolidation; constantly involve themselves with other	They like to stand back and review experiences from different perspectives; collect data and analyse them before coming to conclusions; like to consider all possible angles and indications before making a move; tend to be cautious; enjoy	They are keen on assumptions, principles, theories, models and system thinking; prize rationality and logic; tend to be detached and analytical; are unhappy with the subjective or ambiguous; are tidy and fit tasks into	They search out new ideas or techniques which might apply in their situation; take the first opportunity to experiment with applications; respond to problems and opportunities as a challenge; keen to use relevant ideas from management courses;

people.	observing other people in action; often take a back seat in meetings.	rational skills.	like to get on with things with clear purpose.

2.3. Newcomer

2.3.1. What it means to be a newcomer 'incubant' in relation to Lave and Wenger's (1991) 'newcomer'?

According to Lave and Wenger (1991), a newcomer is an individual at the periphery of the participation in the community of practice. The peripheral individual, like the Groen Sebenza 'incubant', is a newcomer who still needs to identify himself/herself within the community of practice, develop interest, become accustomed to, or acclimatise with the culture and activities of the workplace, produce and reproduce what it is learned, 'become' competent in an occupation, and become innovative, in order to be an active and full participant. They are "those who have not yet developed the full range of skills to perform a job consistently to a satisfactory standard and are generally new to a particular area of work or knowledge" (Cornford & Beven, 1999, p. 33). By the use of the term 'become', I mean 'being or living the practice' (ibid). These cannot be achieved by the newcomer alone but requires support from other participants of the community of practice, and/or the sector as in the Groen Sebenza training plan, and most importantly the newcomer needs enabling conditions to develop from peripheral to full participation. As noted above, this study mostly focused on training-related factors and processes that could help to create enabling conditions (e.g. mentorship mentioned above) for the newcomer/incubant to participate more fully in their workplace community of practice.

As much as the features of the context are important for the learning context of the newcomer, the newcomer is also responsible for his/her own learning in terms of his/her preparedness and flexibility to learn (Lave & Wenger, 1991).

2.3.2. How newcomers adapt to and find identity in a Community of Practice (CoP)

The study drew on theory used by McManus and Feinstein (2008), also used in community of practice studies, called Self Determination Theory (SDT) to begin to examine this question. Self Determination Theory helps to explain aspects such as the [intern/incubant's] *feelings* and *needs* for autonomy (i.e. independence, urgency), relatedness (i.e. sense of belonging and relations) and competence (which I expanded with a view of mentorship above and capabilities below) in order to maximise participation. However modes of adaptation are many, and there may be other factors related to identity formation that are not included in self-determination theory as outlined above, thus the study will not be limited to the ones mentioned above.

The study used the stages of development of participation in a community of practice by (Wenger, 1998b) shown in figure 6 for analytical purposes to show how the newcomer/incubant participates and finds identity in the community of practice. As indicated in the research questions and in the analysis diagram in figure 7, it focused on how training supports and/or relates to these processes. Wenger (2009) further mentioned that it is engagement, imagination, and alignment in and with the practice that guides and constitutes the identity of the newcomer.

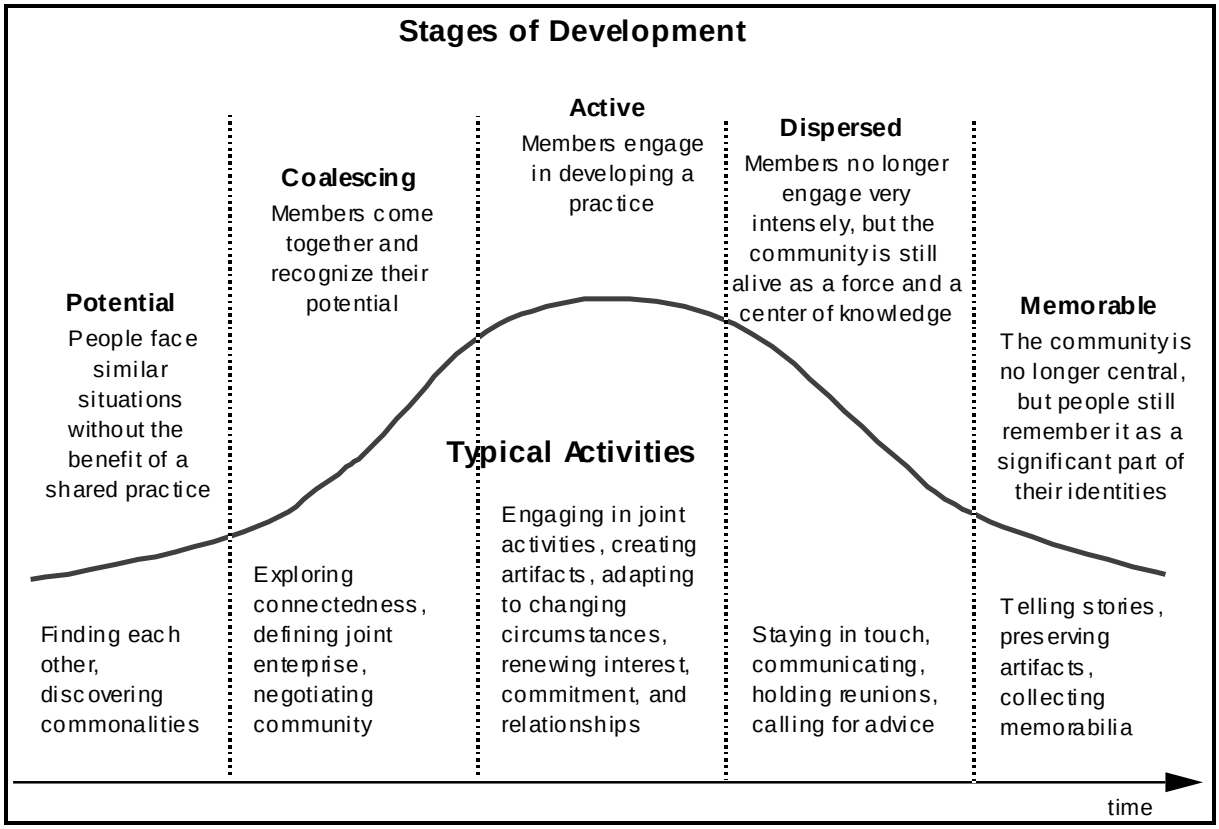


Figure 5: Wenger's 1998b model of emergence of participation in communities of practice and LLP aspects.

Wenger (1998b) in this model explains that the community of practice starts when people deal with the recurring kind of problems (i.e. potential stage). Together as they try to solve the problem and learn from each other, they discover their potential as a unit. By so doing they can see the strengths of each individual which they can bring into the community to solve the problem (i.e. coalescing stage). Then each member is assigned a role or members find their role in the community and start exploring the practice and by so doing they expand the knowledge in the practice (i.e. active stage). In all these first three stages, the members communicate and engage more often to see if they are still on the right track with the vision of the practice. As soon as they become confident about what their role is and what the practice is all about – i.e. identity, they start to become autonomous learners and proceed with their own projects (i.e. dispersed stage). Because they do no longer rely very much on the community, and most of the learning is automatic, their independency then makes the members overlook the basics of becoming a member (i.e. memorable). So the newcomers/incubants might face difficulties in catching up or identifying with the practice depending on what stage of the community they find the community in or depending on how reflexive the members of the community are.

2.4. Whole person development: Capabilities

Whole person development involves the behavioural, cognitive and social dimensions of beings. Amartya Sen's Capability theory deepens this understanding of how we might view whole person development. Sen's theory has been used by many scholars, culturalists and economists concerned with human development because it considers the social order of humans in a wider perspective (Wells, 2012). Of interest to this study is Sen's (1990) view that capabilities involve people's valued beings and doings. I am particularly interested in this aspect of Sen's theory because it can help me to understand what the incubants **value** being and doing in the workplaces, and how this influences their participation and response to the training. Sen's theory of human development can also provide wider contextual views on the quality of life that interns/incubants have access to, influence, achieve, use and create, in order to function and be able to assume the roles and responsibilities required in their workplace community of practice.

Sen further emphasised that fundamental to a quality of life is to have access to resources (instrumental values – e.g. decent job) and social structures (e.g. culture). Those two factors needed to be interrogated especially in this study where the aim of the GS project was to respond to the social inequalities in the management positions of the Environmental sector and deficiencies of other trainings/internships in the sector.

Sen's approach is not the whole story because it only tells us about 'what matters'. And 'what matters' is not enough to make us understand which functions and/or capabilities are worth investing in a CoP for interns to grow and succeed. We need to understand the context and review some of the cultures in the CoPs that the interns inhabit. For instance, the perceptions or assumptions about the interns knowing what they are doing and want to be need to be cross-examined.

2.5. Practice

Practice focusses on what newcomers/incubants do and what they learn in order to benefit from the practice. There is a difference between how people do the actual job and how the job is described and assumed to be (Brown & Duguid, 1991). Wenger (1998a) argued that "The concept of practice connotes doing, but not just doing in and of itself. It is doing in a historical and social context that gives structure and meaning to what we do" (p. 81). Practice can be explicit and tacit. Experience of practice for the interns/incubants implies being in contact with the environment, thus it should be real.

Practice again, is the collective and active doings, sayings, beliefs, values and motives formed around intentional activities that continuously interact with knowledge, produce and use knowledge (Eckert & Wenger, 1994; Wenger, 1998a; Edwards, 2010). This implies that the incubant/newcomer needs to become an informed personnel (being knowledgeable about a field of interest and its boundaries) and can only participate actively if s/he is made to 'feel' a member of the community or have identified with the community (Donald & Westphal, 2013).

Edwards (2010) further noted that in a practice, the motives, engagements and activities that the individual/incubant/newcomer uses in the workplace need to correspond to the activity settings of the CoP and of the institution to show the connectedness of visions. This implies that the incubant/newcomers' activities in an institution should be recognized and valued since each of the hierarchical levels (i.e. institution, CoP, and individual) plays a different role in the development of the newcomer, members and the institution.

2.6. Competence

The notion of becoming competent in the community of practice plays a very important role in the development of members (and the CoP itself) because it gives an identity to a member and recognition to the CoP. It makes a member (and CoP) to review his/her validity

and relevance of his/her practice, status, qualifications and engagement (Wenger, 1998a, b). As members work hard for their competence to be recognized by the CoP, the conditions should enable their competence to prevail.

And because the CoP determines the individual members' competence, the CoP should ensure that its members are competent. This implies that the members should develop professional relationships with other members (Holyoak, 2013), share resources (e.g. data), share knowledge but most specifically they need to create an environment which allows for the building of trust so that they can all benefit. This implies that in a CoP there is no competition but members complement each other, things are done collectively, and the fall of one is the fall of all. Every member has a leadership role to play (Wenger, 1998b) as a result they are responsible for each other. So in this case the success of the incubants/newcomers is dependent on the COP as the COP is dependent on the incubant/newcomers for its growth.

2.7. Internship (workplace learning system) training and workplace learning

As mentioned earlier, the key focus of this study is on internship training that is meant to support their learning in workplaces. However, the study cannot exclude a focus on workplace learning because it is embedded within the social relations occurring during training and job design for the incubants/newcomers (Rainbird, 2000). Since workplaces were initially not designed for learning purposes but for enterprise (Boud & Garrick, 1999; Rainbird, 2000), the study looked at how the training was facilitating learning for its members, most especially to learn how to adapt and competently participate in the community of practice.

Access to training and use of knowledge and skills acquired from training courses (Bratton et al., 2008) were found to be key challenges in internship related workplace training, and they cannot be taken for granted since they are regarded by Lave and Wenger (1991) as the key to understanding and increased participation to take up the roles of the experts. These

challenges can lead to 'negative learning or experience' (ibid) and/or training that is ineffective or even misdirected. In the light of this, internship training programmes need to be investigated to actually understand how they relate to what is really going on in the internships (i.e. how they relate to opportunities for learning and the nature of work environments). Besides access and use, further challenges associated with training can be observed (e.g. that the training may be too abstract, or may not be relevant to the expected workplace roles of the incubants/newcomers), but other issues can only be heard from the perspectives and learning experiences of the incubants/newcomers themselves. This kind of information could be helpful in finding out whether the incubant is able to apply the training, and how the training is related to mentorship and occupational tasks and/or roles, and the incubants' interest in the sector more broadly.

Lave and Wenger (1991) and Wenger (1998a) identified the signs to search for when analyzing workplace learning. These signs were also important to look for in the training of incubants/newcomers and those include the following features:-

- Learning is situated and improvised
- Situations have emergent properties, thus the process of learning is not linear and cannot be generalized
- Process of learning has feedback – the outside environment influences the individual's psychological (immanent) perceptions and vice versa, thus the common place is where the outside world meets the psychological world
- There should be acquisition of knowledge, learning leads the outcomes
- Learning helps in developing identity
- Eventually individuals become what it is learnt
- Learning should provide direction and instill inspiration
- The past and future should be part of the present experience of identity
- Learning is not only mediated by the agreement of perspectives of co-participants but also it mostly occurs when there are differences.

Because workplace learning is located within an informal system which is fluid and unstructured the development of the individuals is not linear and in some cases it becomes difficult to trace their development. Again not all learning is developmental unless there is a goal. Therefore because this Groen Sebenza project has time limitations (and to some

extent they have resources limitations), they do not have sufficient time to ensure that the above mentioned features of learning take effect, hence their learning has to be planned and guided [though Wenger (1998a) would argue that the learning happens, with a design or not]. But in this case it has to, also because at end of the project there are certain outcomes/products that need to be achieved. So this then leads us to the next concept about the need for a development of training curriculum or training program.

2.8. Training curriculum or program

The essence of this study revolves around the concept of training. In section 2.1. I explained training as a process; here I add that it is a process with intent as Lotz-Sisitka (2004) and Schudel (2013) would explain it as 'an intention, plan or prescription, an idea of what one would like to happen in training'. More than anything else it is to ensure that the newcomers/incubants are provided with the workplace experience that is valuable to the labour market (Lerato T. J – Editor of TrueLove Magazine, October 2012 – The intern Agenda) and not only that but also for them to grow and be able to navigate through the two pools of GIS knowledge, workplace GIS knowledge and the domain of GIS knowledge. Each of them requires a particular form or way of learning and serves different aspects in the training and development of GIS skills, knowledge and competencies of the incubant. Thus it is necessary to understand what training in GS entails and most importantly what training is for (i.e. meaning and becoming) and what it is not (i.e. setting up the training curriculum), especially in the context that enables the newcomers/incubants' progression to becoming full participants. Therefore there is a need to understand a training curriculum in the context of workplace knowledge and in the context of the domain of knowledge (i.e. community of practice - the field of expertise i.e. GIS field), so that they are not confused.

2.8.1. What is a training curriculum, what it is for and what it is not?

A training curriculum is a continuous, evolving and iterative process (Cornbleth, 1990) or plan (M.Ed course notes compiled by Lotz-Sisitka (2004) and updated by Schudel (2013))

which involves learning that involves a mutual relationship between a mentor, incubant and the environment (Cornford & Beven, 1999). By the environment I mean enabling conditions which include the organizational culture, support systems, policies (and laws) and so forth. And because it is evolving and iterative it has outcomes and feedback (M.Ed course notes compiled by Lotz-Sisitka (2004) and updated by Schudel (2013)). Therefore training is meant for learning however it is not learning of any kind. This means that it is not the kind of informal learning but a structured and purposeful learning. Firstly let me explain the meaning of this.

Literature has shown that there are two kinds of learning in a workplace, informal learning and systematic learning (Cornford & Beven, 1999), both are necessary and need to be balanced to achieve effective learning. Systematic learning is achieved through thorough training – which means an incubant learns purposefully the learning needs for both the workplace and the domain of expertise; also most importantly the skills learnt need to be transferable(Cornford & Beven, 1999). Unlike informal learning whereby an incubant learns anything in any situation and whatever is learnt is context-related which in many cases the incubant/newcomer works on assumptions, for example adapting to the workplace environment. In this case the incubant/newcomer does not learn the skills to their optimal level. In many cases organizations confuse the two and are more likely to be 'unconsciously' planning for and practicing informal learning rather than systematic learning or even both, contrary to what the initial purpose of the internship training intents.

In fact, in the context of internships, not all workplaces are able to create effective learning environments hence not all workplaces produce or develop newcomers with relevant and/or efficient skills, knowledge and competencies for either the workplace or the domain of the field of expertise. That is the reason why even to this day you still find 'internship hoppers' or interns who are retrained at the same level. This is essentially because there is a lack of understanding of the deeper analysis of the needs, of both the incubant and the mentor for workplace knowledge and domain of knowledge, as a result the approach of what and how training should take place becomes ambiguous. By the needs, I also include the training program of what and how the mentors mentor, and what and how the

incubants should learn in order to be full participants in their field of expertise or community of practice.

2.8.2. Understanding a training curriculum for becoming a full participant in the workplace-specific knowledge and domain knowledge

Here organizations should be careful of what they are training their incubants/newcomers for especially if their intention is not to absorb them into the organization because in a world of uncertainty and change the incubants need their skills, knowledge and competencies to be adaptable. Not only that but it also creates an environment that will allow the incubant to make informed decisions about what they value to 'become' (Sen, 1990) and the environment that will expose them to different opportunities and choices so that they become knowledgeable individuals (Wenger, 2010). Because remember that for the newcomers/incubant to create their own trajectory and navigate through the GIS field, they have to be exposed to the entire landscape of the GIS field. Which means, in an organizational context, breaking down key performance areas into smaller units to show the incubants the expectations according to the organizations' needs, might not be enough to allow them to learn and be equipped with relevant qualities for GIS occupations in general. Because key performance areas could only mean compliance with the mandate of the organization which might serve the organization's purpose more than opening opportunities for the newcomers. Compliance is good but for the newcomer there are other ways which Wenger (2010) refers to as a landscape of practice to choose from. Also compliance could inherently instil a sense of dependency, for instance, the newcomer might be limited or limit him/herself to choosing the kind of jobs or opportunities presented to them. Therefore there is a need to look critically at the context of the key performance areas especially of the newcomers. More than anything else it is important to see what value the GIS CoP training or key performance areas bring to its newcomers as opposed to what the organization schedule requires of them (Wenger, 1998b) because if they do not find value in them they will not participate or give their best (Wenger, Trayner & de Laat, 2011).

Furthermore the training curriculum has to be contextualised (Schudel et al., 2014) and 'treated as value laden' (Cornbleth, 1990). By contextualised I refer to what Cornbleth (1990) referred to as 'both structural and sociocultural'. As such the concepts mentioned and discussed in this study could be useful in guiding the process of contextualising the curriculum development in the internship curriculum or programs. This is a serious concept (i.e. contextualisation) and important to be considered in the internship training programs especially in the environmental sector because it does not only assist in creating sustainable jobs where the newcomers grow towards full participation in their CoP but also it assists the country's progress towards long-term socio-ecological balance and sustainability (Olvitt & Hamaamba, 2006). As a matter of fact without proper planning of an internship program or curriculum, the training can be a waste of time for both the intern and the workplace (Lerato T. J – Editor of TrueLove Magazine, October 2012 – The intern Agenda).

2.9. Reflexivity of incubants as the experience evolves

The study sought to understand if and how training may contribute to reflexivity in the intern/incubants' everyday life activities within their communities of practice and also amongst decision makers and implementers of the training. Such reflexivity occurs when incubants shape their own meanings as they define their course of action and change their practice and place in the social structure of the community of practice. The purpose was to examine if and how the incubant pursues "what they care about most (i.e. personal concerns) in the social order" (Archer, 2012). Such reflexivity involves dialogue between the cognitive, feelings and social context relations as experiences evolved and is about the evaluation, feedback and urgency of actions. As such training, like learning, requires a reflexive attitude since it is an iterative process.

2.10. Community of Practitioners

This involved examining who was or should be involved in the training of the Groen Sebenza incubants as they apply training to the workplace in their communities of practice.

2.10.1. What kind of CoP incubants may inhabit?

While Groen Sebenza offered and supported specific training programmes at national and provincial levels as discussed above and below, Groen Sebenza programme's objective [as well as this study's purpose] was not necessarily to isolate and restrict those who should be involved in the training of the incubants to trainers only. Wenger (1998a) argued that a community of practice is not necessarily the team or the organization or that it should have a name; rather it involves individuals who naturally have the best interests at heart to pursue the development of knowledge to better the practice. He says they are linked through a joint enterprise with mutual engagement and a shared repertoire, and because they are a community that continuously interacts with each other and the world (i.e. they evolve and recover); they are a "community that learns" (Wenger, 1997; Pór, 2001). Though they [i.e. an incubant and mentor and other colleagues; supported by trainers] may exist naturally in relation to a particular practice (e.g. wetland management/GIS etc. practices); they still need attention, support and recognition, most importantly their existence and work needs to be supported and valued (Wenger, 1998ab).

Also because members of CoPs have a history of social learning, they can create boundaries that are either permeable or not for the newcomers as such the newcomers may construct different identities even if it is the same department/institution/sector (Eckert & Wenger, 1994). For example, depending on how GIS expertise is recognised and supported in an institution, the mentor's training approach and the interns' background determine how the interns construct their identities within the field (Kevin pers. comm., 2014).

2.11. Culture

Cultures are embedded within or created by many things including historical relations, political relations, socio-economic relations, values, class, gender, etc., in training programmes and in workplace communities of practice. The term culture in this context is defined using the work of Schreyogg (1992) and Allaire and Firsirotu (1984) in von Rosenstiel (2004). It is defined as the implicit phenomenon that is usually taken for granted which

characterises the organization's image, values, and meaning. It can be verbal, interactional and artificial (von Rosenstiel, 2004). The culture can also be about how people perceive others. For instance, Lindner (2004) argued that the titles we give to practices or cultures already define the underlying perspectives, relationships and meanings attributed to them. So the question was, what label do staff give to interns or 'incubants'[14] in the context of the training and their work: are they "trainees", "volunteers" or some version of "employee"? The ways in which they are referred to and treated in cultures of training and work, may also determine their relationships and behaviours in training initiatives and in their participation in their communities of practice. And those who are affected by the organizations' culture will have their own images or interpretations of them, and this may also determine how they participate in their communities of practice. These kinds of perceptions are important aspects of transformation (HSRC, 2009) and are often overlooked, especially in internships [I have had experience of this in two conservation organisations to date]. Such issues also provide the motivation for the construction of the 'Internship Workbook' mentioned earlier (Rosenberg & Raven, 2011), which sought to address a culture of neglect of the value and orientation processes necessary for interns in South African conservation organisations, and gave support to the main training initiative of the Groen Sebenza programme.

2.11.1. *What culture do internship programmes portray in an organization?*

Lindner (2004) argued that the titles we give to practices or cultures already define the underlying perspectives, relationships and meanings attributed to them. This does not necessary mean that members of the culture learn or make interpretation from the culture at hand, but could be carrying those perceptions from previous cultures or surrounding cultures. Similarly in some cultures the title internship may already be understood or observed as a breach with one concept of culture and lead to the promotion of certain behaviours. For instance, in order for one to understand an organization and its purpose, examining the organogram can be a good start but is not always a representation of what is

[14] The Groen Sebenza programme is already referring (somewhat uncritically) to these new workplace professionals as 'incubants', as noted in footnote 1 above.

actually happening in the organization (von Rosenstiel, 2004). However, by virtue of the organization having an administration structure or organogram, either in hierarchical or latitudinal order, it already assumes rules and roles of responsibilities to coordinate the individual's activities (von Rosenstiel, 2004). As such the administration structure will "implicitly" determine the relationships of members. In a nutshell, if culture ***α*** [i.e. organization, team] within itself has identified a certain practice as a different culture ***α1*** [i.e. internship] then it is it the responsibility of the culture ***α*** to ensure that its members [i.e. staff], including culture ***α1*** [i.e. interns], are properly oriented and inducted, especially if the organization as a whole is seen as a culture.

Von Rosenstiel (2004) further argued that "the organizations' existence depends on people; they fulfil particular functions in human life, are therefore subject to social change and should, accordingly, be observed historically … they must therefore also be made clear what significance they have for the individual, how they are interpreted and what image people have of the organization" (p. 130). Those who are affected by the organizations' culture will have their own images or interpretations of these realities which are usually overlooked, especially in internships, yet they are more important than the organizational strategy, etc., (von Rosenstiel, 2004). Von Rosenstiel (2004) further argued that these interpersonal relations amongst individuals determine any change in the organization hence its development. On the other hand organizational development stimulates growth in individual's development which includes pro-activeness, innovation, taking charge, and ultimately becoming free and confident in decision making. This however will not be realised if the culture is authoritative and discriminatory. The socio-historical background of South Africa with its legacies of gender and racial discrimination still exist today within workplace environments (HSRC, 2009; Benya, 2013), and this hinders individual development.

Summary of the chapter and introduce the next chapter: This chapter attempted to describe the main features of training that would be effective, specifically in the context of newcomers entering a community of practice. The next step describes how I have purposefully searched for such information and who have involved, also giving reasons why the methods and each participant were selected.

CHAPTER 3: RESEARCH METHODOLOGY

3. INTRODUCTION TO THE CHAPTER

This chapter provides insight into how I designed the steps to obtain data that responded to the main question of the study. The different methods used were aimed at understanding the experiences, perspectives and attitudes of the participants by simply asking the questions 'what', 'how' and 'why' (refer to appendix 3). The chapter also deals with the most significant ethical issues encountered such as consent, confidentiality, and anonymity issues.

Finally the chapter looks at how, once the data was collected, I managed and analysed it including issues such as transcription, recording and interpretation. Furthermore once the data was analysed using content, observational and documents analysis, I describe what strategies I employed to ensure validation.

Because this study involved participants who were based in diverse workplaces I was impelled to have some flexibility and spontaneity in terms of how and when to collect data. This was because the scheduled time and venues did not always take place as planned (refer to appendix 7 and table 5), and I was required to be cognisant of the participants' temperaments and how to respect them.

3.1. RESEARCH DESIGN AND SITE SELECTION

3.1.1. Study sites and participants selection

To start with, I had to obtain an overview of the number of GIS incubants and mentors involved in the Groen Sebenza internship. I found that there were about 40 incubants and less than 25 mentors. I obtained this information from the Groen Sebenza database which listed the number of organizations which needed GIS practitioners and listed the contact

details of mentors for each organization. As mentioned in section 1.2.2.5. (p. 25) the GIS occupations varied with titles from GIS officers, GIS technicians to GIS specialists. Even so I did not select the study's participants according to titles because I noticed that even when the titles differed their roles were similar, a challenge that was also highlighted by the HSRC (2009) report.

The process that I used to select the study participants was to trace where GIS technicians were located through the Groen Sebenza placement system. Through this process, I initially identified GIS technician interns in SANBI [a parastatal institution], DEA [government]/ESRI [private], LEDET [government] and Kruger National Park-SANParks [semi-government]. However during the preliminary consultations to see if it would be possible to work with the GIS technicians' incubants from these organizations many challenges emerged. For instance at Kruger National Park (KNP) the GIS incubants indicated that they did not have mentors so they had to be moved to other departments, such as the Environmental Education (EE) department, and "because the EE department did not have activities that had to do with GIS, the incubants were bored most of the time" (KNP-GS Mentor pers.comm., 2013). She, the KNP mentor, assumed that the main reason why the GS incubants did not have GIS mentors was that the KNP's GIS department did not request the GS incubants; therefore the incubants were not included in their planning. Because of this situation I eliminated KNP as a host institution to be investigated but this insight was useful for the study overall (see section 1.3.).

Another challenge was that, as per the GS internship framework, it was hoped that each incubant would have had his/her own mentor, a ratio of 1:1. This was not the case in some instances. At SANBI indeed it was 1:1, but at LEDET it was 2:1 and at ESRI in one case it was 2:1 and the other was 1:1. Actually at LEDET it was 3:1, but the third person was the intern that LEDET usually appoints every year through their annual internship programme. Nonetheless, the fact of having more than one incubant per mentor added interest to the study especially when I was investigating the level of engagement between the mentor and incubants. This influenced how I chose the participants, to see the difference between one mentor working with two incubants and one on one mentoring.

In addition to the selected mentors and incubant participants, I was able to interview two managers of the teams/departments which were located at the same CoP as the GIS incubants, also the SANBI-CEO, Dr Tanya Abrahamse (who was also a pioneer of the GS internship establishment).

Again because this study needed different dimensions of understanding of the GIS skill and its industry and trends, I further asked [following ethical procedures] the Director of CSS Geographical Information Specialists Ben Cobbing to participate in the study. He was delighted to participate and willing to assist with any information. I was then able to send a semi-structured questionnaire via e-mail to him and requested his availability to be interviewed by me should the need arise.

All the incubants in Groen Sebenza were recruited to fill occupations that were identified as priority skills or scarce skill[15] that were needed in host organizations. And as argued in Chapter 1, my focus on the GIS skills was because it was also identified as a scarce skill through wider sector analysis by GreenMatter and the HSRC (2009) study on human capital needs in the Biodiversity sector and in the BHCDS.

3.1.2. Overview of the study design

The study's 'main' participants were six GIS incubants (four females and two males – their brief biographies are provided below in the results section, Chapter 4, table 9), two mentors, two managers who played mentoring roles to GIS incubants, and Dr Tanya Abrahamse and Mr. Ben Cobbing. I refer to these participants as the 'main participants' however they were not the only ones that I collected information from. I also sent semi-structured questionnaires (for sub-question 4) to 20 GIS incubants in 10 organizations and 10 GIS mentors, of these two were returned by the incubants (i.e. one from DEA (WfW) incubant and the other from Cape Nature) but nothing was returned from the mentors.

Also importantly, in the development of this thesis I engaged with the leaders of the

[15] **Scarce skills are defined as 'not available' due to shortages, which are absolute (they don't exist in the country at all) or 'relative' – there are factors affecting the supply and recruitment of such skills – GIS technicians fall into this category of scarce skills (DEA, 2010).**

GS internship project, Ms. Vivian Malema (GS Project Director – known as “Mama Groen Sebenza”) and Mr Donovan Fullard (GS Programme Manager – known as “Papa Groen Sebenza”), who contributed enormously (i.e. information and materials) and were helpful in many cases.

The process of collecting data was employed in accordance with the Groen Sebenza training plan (refer to study design below). As shown in figure 7, the plan was that in the first six months of the programme, basic training of both a formal and informal nature was to have been conducted.

This section provides an overview of the study design and methodology; captured in brief below, and discussed in more detail thereafter.

STUDY DESIGN AND ANALYSIS PLAN IN RELATION TO THE GROEN SEBENZA TRAINING PLAN AND WENGER's (1998) MODEL OF HOW PARTICIPATION IN A COMMUNTY OF PRACTICE EVOLVES

Groen Sebenza Training Plan (June 2013 – December 2015)

National Training: Personal & Professional for all interns (at least 1 x per annum)		**National Training:** Personal & Professional for all interns (at least 1 x per annum)		**National Training:** Personal & Professional for all interns (at least 1 x per annum)
Regional Training: Cluster-based (1x six months)	**Regional Training:** Cluster-based (1x six months)	**Regional Training:** Cluster-based (1x six months)	**Regional Training:** Cluster-based (1x six months)	**Regional Training:** Cluster-based (1x six months)
In-house Training (ongoing): Customised interests of learner and based on learner-mentor interactions and regular reviews		**In-house Training (ongoing):** Customised interests of learner and based on learner-mentor interactions and regular reviews		

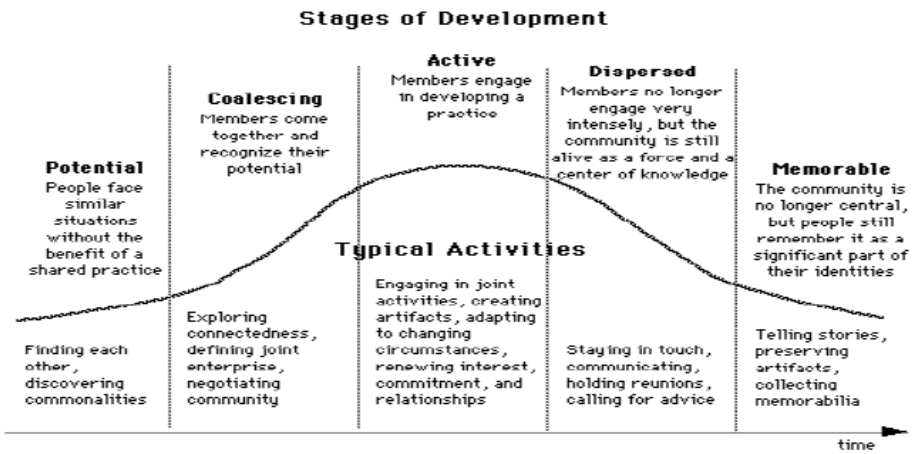
Research Question:
In what way can training in the first year of a 2.5 year internship incubation model strengthen the learning, experience, knowledge, skills and interest of graduate 'incubants' towards their full participation in workplace roles and responsibilities in biodiversity occupations?

Focus: Observation and Analysis of Year 1 of training and participation of three GIS (scarce skill) GS incubants in three biodiversity workplace COPs

STAGE 1 ANALYSIS
Analyse the training programmes and their assumptions relating to incubant's participation in their workplace COPs – in 3 biodiversity workplaces (where the 3 incubants will be placed): *Mainly document analysis, and analysis of interviews with trainers and mentors.*

STAGE 2 ANALYSIS
3 INCUBANTS experiences, interests, knowledge and skills (prior to training; during training and after training); and their involvement in a biodiversity workplace COP: Mainly analysis of interviews with incubants, diary entries of incubants, incubant and mentor reporting (every six months); and workplace observations in biodiversity workplaces (data generation will take place in phases over a 1 year period)

STAGE 3 ANALYSIS
Critically analyse data from Stage 1 and 2 analysis, using COP theory and Wenger's model (see below), which shows emergence of participation in a COP (towards full participation)



Note: This time-line in the Wenger (1998) model is not necessarily matched to the GroenSebenza training implementation plan. It does, however, provide a useful emergent process framework within which the legitimate peripheral participation process can be analysed. The analysis will include other aspects of Wenger's theory especially: learning, identity, participation and practice as outlined in the proposal as well as aspects such as reflexivity and culture (focus on workplace culture and how this influences training and learning experiences).

Figure 6: Summary of the research design.

3.1.3. Why qualitative research?

The questions raised in this study were difficult to address using a traditional paradigm of research which involves hypothesis testing using quantitative methods. The study therefore employed qualitative research approaches because it "… attempts to understand the world from the *subjects' point of view* [which matched the LPP-CoP concept], to uncover the meaning of peoples' experiences, … to uncover their everyday life/lived world which may not lead to objective information/scientific explanations" (Kvale, 1996, p. 1) and was concerned with how people think and feel about the topics of concern for the research. It was concerned with contextual and in-depth information of the phenomenon, and required 'thick descriptions' using qualitative data.

The main objective was to understand the training experiences and their relation to the workplace communities of practice from the incubants' perspectives or interpretations (refer to the Research Questions in section 1.3.). This was in order to understand why incubants do what they do and how it related to the training (or not). This did not necessarily mean qualitative methods were better than quantitative methods but it merely indicated that in the case of this study, quantitative methods were not going to fulfil the purpose of the study should they be used. In fact at some point I needed to use figures – which are quantitative (refer to Chapter 4, graphs 1-3, which shows that these two methods actually complement each other) to explain some of the situations. The study not only intended to understand the everyday life realities (i.e. processes, situations, practices, experiences, feelings, knowledge, interests etc., to construct a social world) but also sought to recognise the new and "unknown" realities that were taken for granted (Bergmann, 2004a).

Again, the intention of the study was not to generalise interpretations but to understand how individuals 'subjectively' create meanings and make them relevant to their 'objective' life situations in their workplace communities of practice. Though reality was created interactively (Flick, von Kardorff & Steinke, 2004), the experiences were felt differently by individuals (Lindner, 2004).

3.1.4. Why case study?

By using the case study, the study wanted to provide an in-depth investigation of a social phenomenon in a given time and space (Ragin & Becker, 1992). The study was therefore concerned with how the training in the incubation model enabled incubants to develop personally and professionally in order to participate effectively in their respective workplace occupations. To understand this complex relation, there was a need to give a thick description of participants lived experiences i.e. thoughts, feelings and doings in 'real life context' (Cohen, Manion & Morrison, 2007) in the internship program which included observing incubants in the training context, in their workplace environments, and involved interviews with them, their mentors and managers (see section 3.2. below).

As mentioned earlier the case of this study was embedded within a multi-layered, nested case study design (refer to figure 1). To understand a multi-layered case study, I used the analogy of the cone, assuming the tip of the cone is a point of focus (i.e. the incubants); it entailed unpacking and understanding the conditions of every layer of the cone which influenced the conditions at the tip of the cone. Every layer therefore presents the context of the study and conversely the case of the study cannot be studied outside of that context (Flyvbjerg, 2006). Therefore any intervention or any change required at the focus point would need a reflexive examination or change from each layer and vice versa.

The nested case study approach involves as Lotz-Sisitka and Raven (2004) described it as 'cases within the case'. So going back to the cone analogy, this study was about a plate holding several cones [plate being the Groen Sebenza project, the opening of the cone being the institution down to the incubants at the tip].

In case study research, for a researcher as an outsider, it is difficult to fully understand the in-depth information of the situation if they are outside of the situation, for that reason I needed the insiders (i.e. the project inventors, incubants, mentors and managers) to present their perspectives to provide a better picture or other dimensions of the issue. Thus in case study research a researcher cannot claim the study as a case study if there is only one

perspective, the outside perspective, of the research, unless the researcher understands both sides, the outsider and insider. As indicated in section 1 I did have some prior experience of being an intern in two organizations in the Biodiversity sector, so this helped me to bridge the insider-outsider dynamic for this case study research.
Moreover once the situation or the case is understood from different dimensions, actions have to be put in place (Lotz-Sisitka & Raven, 2004).

3.1.5. Why interpretive study?

The research orientation of this study is interpretative because it is based on the premise that there are lessons to be learnt from graduates' personal experiences in the project which will inform future decisions in improving the implementation of the project. Though their experiences will be different in nature, each of them will reveal an essential aspect that can be useful. The knowledge which will be generated by the study will hopefully have a "beneficial effect", whereby these experiences will be shared amongst the interns and the different organizations and decision makers who are considering developing young graduates to prepare them for work environments. This kind of study where people share their experiences is effective at contributing to learning for personal and occupation purposes (Mander, 1992) as indicated in section 2.2.4. This is lacking in the body of knowledge about internships, particularly in the environmental sector. This study therefore intends to provide insights that are based on experiences that can be passed on to the readers in the hope that they too will be able to learn from them.

3.2. DATA COLLECTION METHODS

Data was collected on different occasions as follows:

- At the December 2013 National Induction Training at Birchwood, Boksburg-Johannesburg;

- At the respective workplaces, LEDET- Polokwane, SANBI- Pretoria and ESRI-Midrand and
- During the Biodiversity Planning Forum 2014 at Mpekweni Beach Resort, East London;
- Through on-going e-mail communication.

The purpose of planning the data collection design is to ensure that the data collected are meaningful and respond to the research questions [including goals and theoretical framework]; and are within the scope of the research (i.e. time, space and resources - competences); and are as independent of the investigator's influence as possible (Flick, 2004a), although qualitative case study research does allow the researcher to be reflexive of his/her subjectivity in the research.

To capture the social reality of individuals, it is important to use ethnographic-type procedures such as interviews, diaries and documents (Lindner, 2004). As a researcher, I sought to follow the incubants in their respective workplaces for a week [per incubant] after the first semester because according to the Groen Sebenza internship program plan, the training would occur in semester phases. So it was assumed that by the month of December 2013, the incubants would have been introduced to the most important aspects of training such as induction and a couple of informal and formal developmental training sessions. This timing was set to allow me to both probe the training programmes and their content, and the incubants experiences thereof, but also to see how the training was integrated into their workplace practices and how it related to their roles as newcomers in workplace communities of practice. In addition I planned to conduct interviews with them in their work places and I also planned to analyse materials such as working materials (e.g. workshop pamphlets, career guidance brochures, work support materials), materials that they got from the training, their journals and any other material that could be of value to the study's objectives. However, data collection plans changed to some extent due to unforeseen circumstances which I shared in every method I employed. Below, I share what data I collected, how and why.

3.2.1. **Semi-structured (open-ended) interviews**

By a semi-structured, open-ended interview, I mean the use of in-depth questions that were not too structured (e.g. choosing from fixed prompts) so that the interviewee's response could be flexible and allow for unexpected responses. At the same time the interviewee's response were guided by the topic of interest at hand (Hruschka et al., 2004).

There is extensive literature about how to conduct semi-structured interviews and open-ended interviews, which is very useful. However I found that the success of the interviews in this study depended on my careful consideration of the context or situation but also mostly depended on the personalities of both the interviewee and myself and our relationship.

I used semi-structured interviews as a tool because they are commonly used in exploring social learning in communities of practice because of their important role in sharing the reality of lived experience from the participants' perspectives and observations (Hopf, 2004b; O'Donnell & Tobbell, 2007). Semi-structured interviews are useful in trying to discover new dimensions of the problem studied and allow for follow-up to explore issues that have emerged from the previous interview (Miller & Brewer, 2003). Because the study traces the incubants' experiences, learning, skills and knowledge over time, similar questions about training experiences, application of training, and how training supports their workplace were asked each time I met the participants.

3.2.1.1. Planning and organization for the semi-structured interviews

I started the process of interviewing in November - December 2013 (eight months after the internship had commenced). These interviews probed issues related to sub-question 2 specifically. In May 2014 (11 months later) the questions focused more on sub-question 3 and 4. However many of the planned activities did not go as intended but fortunately my

schedule was flexible. For instance, the participants and I would plan a day and time for an interview however on the day of the interview and often when I was already at their workplace the participants would cancel the appointment or postpone it. This study took advantage of the impulsive activities occurring at the workplaces, by planning ahead and putting contingency plans in place especially in terms of time.

Firstly, I sent formal letters of request for permission (see appendix 1 and 4) to incubants and mentors (via e-mail) to participate in the study. The letter was accompanied by a semi-structured questionnaire (see below for details below). The letter entailed a brief description of the interests of the research study. The questions in the semi-structured questionnaire were the same as the ones I used in the interview. This was because:

- Firstly, I did not know the personalities of the interviewees and how much of my presence, as a researcher (e.g. a psychological distance influenced by the fact that I am a young black woman with dreadlocks) would affect their response. For instance, it is known that some people would feel freer to write down their experiences rather than expressing them in conversation, and vice versa. Again, if the questions were sent in advance they may feel at ease and be prepared because they know the kind of interview they are going to be engaged in.
- However it is arguable that they might prepare answers which seemed "right" for the interview or "what the researcher wants to hear", however because I wanted the interviews to be conversational, I had the flexibility to change the order or wording of questions (Ayres, 2008) depending on how the conversation proceeded. In cases where I felt the interviewee responded without understanding the question I would probe further with more questions [at times those questions were not written down]. The focus was not on right or wrong answers but the answers depended mostly on the feelings and mood of what the interviewee wished to express at that time which might not be the same before or after the interview. The validity and reliability of these self-reporting methods were based on the fact that they are more efficient and feasible as compared to other methods such as structured-questionnaires especially if the intentions were to harvest self-experiences, opinions, interests, beliefs, values, etc. (Hruschka et al., 2004). The validity and reliability of these reports were again checked by key pieces of information from their mentors

and other incubants however some of the information was too personal so I needed to rely on the information the participants provided at that time.

- Because this method relies on reporting past experience verbally, I gave them the same questions after the interview. This was in case they had forgotten to ask or say something or had any burning issue they could always respond and forward them via e-mail or communicate with me through other social networks I provided in the permission letter.

Each incubant and each mentor received a separate e-mail and line of communication to avoid tensions between the mentor and incubants unless they both agreed to receive a combined e-mail.

I then sent, in advance, a suggestion of days I planned to visit and days where I was available for interviews and observations (refer to appendix 7) so that they could suggest days suitable for their schedule.

3.2.1.2. Execution of interviews

Figure 7: The 2014 Biodiversity Forum attended in Mpekweni Beach resort, East London.

As mentioned above in some instances some venues were not planned for the collection of data, especially interviews. For instance my attendance at the Biodiversity Planning Forum (2014) was not planned to interview the participants but as some participants were not available at the appointed times and were going to attend the forum (refer to the picture above), they could make time for me at the forum.

I was fortunate to attend the forum and to be sponsored by SANBI as they recognised that my study was embedded within the Biodiversity sector and might assist them in the future. Initially my interest to be part of this forum was to see what ideas, projects, policies, etc., are put in place and how they would affect the training of skills especially the GIS skills. Also as a researcher I needed to be informed and hopefully assist the GIS novices/newcomers about the upcoming trends of the GIS industry. An interesting observation during the forum was that almost 80% of the presentations demonstrated the need to acquire GIS skills and many presenters used GIS skill to deliver their presentations. This did strengthen the HSRC (2009) report and GreenMatter finding about the GIS technology/skills being one of the skills needing improvement and being in demand. The forum not only benefitted me, as a researcher but also the GIS incubant sand professionals who saw a need to use these skills in their different occupations.

Figure 8: SANBI-CEO, Dr Tanya Abrahamse (on the right) being interviewed by me (on the left) at the Biodiversity Planning Forum.

The key highlight of my attendance at the forum was the opportunity to interview the CEO of SANBI, Dr Tanya Abrahamse. This was a milestone for me because in many cases it is difficult to gain an interview with CEO's. Her information was valuable and revealed a bigger picture of the Groen Sebenza project and its prospects.

The interviewee chose a venue where they felt comfortable for the interview (refer to the picture below) and which was suitable so that I could use the voice recorder. Before starting the interview I introduced myself, explained the process of the interview, and re-emphasised the interest of my study. It is also known that when people are placed in an informal setting they tend to be themselves and converse more freely than when they are in a formal setting.

Figure 9: The picture depicts examples of the different places where (top left & right) and how (bottom left) the interviews were conducted.

I allowed them to ask questions regarding my introduction (refer to the transcripts in the appendix 8). Most interviews took a period of between 20 – 70 minutes. During the interviews I ensured I did not lead or influence the participants' answers (von Rosenstiel, 2004). However it was difficult to be objective at all times because if I did not show any emotions either to support the interviewee or not, the interviewee could perceive my expressions as being inconsiderate or insensitive to their issues or would just assume that I was not interested. However these were the trajectories that were inevitable and called for sensitivity and for making rational judgements in each situation.

Additionally, literature (Sterrett, 1978; Cappella, 1981) has shown that there are different ways a researcher should express his/her body language and movement during the interview in relation to the interviewee to demonstrate the relationship between them. This is because body language can determine the outcome of the interview. For instance, I chose to sit close enough (refer to the picture above) in order to create an environment which would allow them to be open and to make them feel welcomed into my space. On the other hand I did not want them to feel as if their space was invaded. Again, as much as my conduct was informed by the literature, I also allowed the setting to guide the flow of my behaviour and gestures.

Another activity I conducted during the interviews was to audio-record the conversations. Again, even here things can go wrong and I made sure at all times to use three different tools for recordings which included my personal phone, tape recorder and the laptop. This was just for in case one tool failed, for instance at some point during the interview I was not aware that the batteries for the tape-recorder were dying and it was only after a while in the conversation that I noticed the tape-recorder was switched off. But because I had alternative tools I was safe but I did learn that I should always carry extra energy supplies for the tools and always check during the interview if the tools were operating. One must be aware that checking on equipment can hinder the flow of an interview.

In total, I conducted 20 interviews as shown in table 4 below.

Table 4: Table listing when and why all the interviews were conducted.

Interviewee	**Date and index code**		**Purpose of interview**
Note: Names with * are not real interviewees' names	**1st interview**	**2nd interview**	
LEDET Manager + mentor 1 Kevin*	21/11/2013 (Kevin 1)	07/05/2014 (Kevin 2)	To gather insights about Groen Sebenza (GS) training at LEDET and the incubants' progress in general
LEDET Mentor 1 Treve*	21/11/2013 (Treve 1)	07/05/2014 (Treve 2)	To understand GS training from the GIS mentor's perspective at LEDET and gather insights about the GIS incubants' progress from their immediate mentor
LEDET incubant 1 Tumi*	21/11/2013 (Tumi 1)	06/05/2014 (Tumi 2)	To understand GS training from the GIS incubant's perspective at LEDET
LEDET incubant 2 Calvin*	21/11/2013 (Calvin 1)	06/05/2014 (Calvin 2)	To understand GS training from the GIS incubant's perspective at LEDET
SANBI mentor 1 Thoko*	18/11/2013 (Thoko 1)	14/05/2014 (Thoko 2)	To understand GS training from the GIS mentor's perspective at SANBI and gather insights into the GIS incubant's

			progress from their immediate mentor
SANBI mentor 2 MacD*	18/11/2013 (MacD 1)	15/05/2014 (MacD 2)	To understand GS training from the GIS incubant's perspective at SANBI
ESRI manager +mentor 2 Sofia*	02/12/2013 (Sofia 1)	n/a	To gather insights into GS training at ESRI and the incubants' progress in general and from their immediate mentor
ESRI incubant 1 Tso*	02/12/2013 (Tso 1)	12/05/2014 (Tso 2)	To understand GS training from the GIS incubant's perspective at ESRI
ESRI incubant 2 Lebo*	02/12/2013 (Lebo 1)	n/a	To understand GS training from the GIS incubant's perspective at ESRI
ESRI incubant 3 Mosidi*	02/12/2013 (Mosidi 1)	n/a	To understand GS training from the GIS incubant's perspective at ESRI
SANBI/Groen Sebenza director Ms. Vivian Malema	March 2013 (Ms. Vivian Malema)		To understand the entire perspective of GS project – including its history of establishment and intentions.
SANBI/Groen Sebenza manager Mr. Donovan Fullard	March 2013 (Mr. Donovan Fullard)		To understand the entire perspective of the GS project – including the history of its establishment and intentions.
SANBI CEO Dr. Tanya Abrahamse	14/05/2014 (Dr. Tanya Abrahamse)		To understand the entire perspective of the GS project – including the history of its establishment and intentions.

3.2.2. Open-ended Questionnaires

As the study is concerned with in depth knowledge, responses to sub-question 4 would be strengthened through the use of open-ended questionnaires to get an overall picture. Initially the plan was to administer the questionnaire twice after the first eight months of training, and again after the following four months of training (within a 12 month period). Even though my study was introduced during the National Induction Training in December,

and was explained again in the e-mail I sent to them, many GIS incubants did not fill-in the questionnaires as only three responded. In following up on the matter many explained that they had too much administration work to do and my research was not a priority. It was understandable and I found it necessary to address this issue as it has the potential to resurface especially in the workplaces where the participants see no direct benefit from the study.

However despite those challenges, the data I collected from the small number of questionnaires returned and interviews conducted was sufficient to continue the study. This was made possible because I used opportunities like adding more participants such as the CEO of SANBI who was well-informed about the project and on-the-ground operations, even though it was not specifically about the GIS field. Although I could only extract the perspectives from the CEO level, there were other opportunities such as attending presentation by GIS experts where all GIS incubants attended and could discuss issues that mattered.

3.2.3. Participant diaries

Again, initially I planned to ask incubants to record their everyday lived experiences in their workplace and training in diaries, but this approach was unsuccessful. This was proposed because Lüders (2004) suggested that if the investigator wants to obtain rich information about the participants' everyday worlds without getting physically involved or observing them every day, diaries can be of good use. Through diaries I, the researcher, was hoping to be able to see principles and mechanisms that incubants used to cope, to express themselves, and gain insight into what they do in social interactions with others, which is not always the case in interviews.

At the start of the research (November-December, 2013), I requested the participants (the six incubants) to keep a diary about their lived experiences in any training, in the internship programme and the organization. I guided them and suggested subjects and themes that needed to be included in the diary; but I also engaged with them in a discussion about the themes so that they could also contribute to the design of the diary writing process. I tried

to obtain a fairly standardized set of themes for all of the incubants. However things did not turn out the way we expected because they were swamped by a lot of administrative work that needed to be submitted to their communities of practice. Even though in the beginning I suggested that they could use the assessment system they used to submit their progress report, they still did not have time to send any documentation. There were follow-ups conducted regarding this matter, often via e-mail when they were reminded about the submissions, many were apathetic about diary entries citing the same reasons that their jobs required a lot of writing as well as "there was a lot of admin work from GS expected from them" (Lebo pers. comm, 2013, Tso pers. comm, 2013, Thoko pers. comm, 2013 & 2014).

The fact that they were not submitting any progress report to me implied that they were also not submitting any progress report to their institutions or mentors. It then raised a question of how the institution and mentors knew which incubants needed intervention if they were not monitoring their progress.

3.2.4. Observations

According to Garfinkel and Sacks' in Bergmann (2004a) activities cannot only be explained through interview responses but also require observations of situational practices of everyday life. This is because some practices can be seen but may remain unnoticed in conversations. Bergmann (2004a) also argued that interviews are driven by intuitions and spontaneous understanding but do not 'really' give the 'full' or 'final' picture if observations are not conducted, because observations also record behaviours that may be against intuitions.

In this study observations were carried out at regular intervals. Notes were also made on the activities. Observations helped me to construct contextual understandings of the workplace communities of practice that the incubants were part of, and how they operated, and also how the incubants participated.

However since I did not have any idea of how the incubants were going to behave and could not predict how and what they were going to do, I recorded each and every activity they

conducted on that day. For instance, I took photos during lunch time, when they went to fix their admin issues with the main office, when they were doing their work, when they were assisted by their mentor, etc. I also looked for artefacts which might suggest culture, values or even the working environment in which they were located and their study materials.
The following are the examples of the observations made.

Figure 10: This picture shows different ways of how the mentors interacted with the incubants.

Figure 11: These are some of the objects displayed on the walls at the incubants' workplaces which reflected aspects of the workplace culture.

Figure 12: This picture shows examples of different learning materials the incubants used.

Figure 13: This picture shows the things the incubants used to do together. For example, they shared food, they helped each other to fill documents/forms, they helped each on the work they used to do, and they discussed issues with other incubants from the different communities of practices.

Figure 14: This picture shows what most of the days were like for incubants, for instance, they wasted time looking at the internet, they idled around or making small errands to solve admin errors, filled in forms and most of the time they were bored and ended up fiddling with their cell-phones.

Figure 15: This picture shows different workstations from different organizations occupied by GIS incubants.

3.2.5. The training I took part in and observed - how I undertook the observations.

I attended the induction training for five days and I took photos of each activity, including the presentations of guest speakers (refer to figure 16). Because I was following the GIS incubants, I went to every activity which they were involved in including the presentation of the GIS expert, Ms. Heather Terrapon. And I also asked for the PowerPoint presentations of each speaker during training for reference. I had the advantage of taking photos during the incubation training because my research was introduced and because I was given tasks to do for GS, as a task team member, it was easier to make observations, at a distance and close-up.

I also got the opportunity to attend the training where Mosidi was facilitating (at ESRI) (refer to figure 17) for about two hours.

Figure 16: The view of the hall where the induction training took place.

Figure 17: This is a room where Mosidi was giving trainers to ESRI clients.

In summary, I conducted the following observations:

Table 5: A list of when and why all the observations were done. Please note that observations were not conducted in sequence as the list indicates but they were taken in a natural setting. Meaning, for example they were taken during conversations, while strolling around, while waiting for the interviewee and so forth. The duration shown on this list is the estimation of how long I took to do the observation and sometimes the observations were conducted in intervals, also they were taken in parallel.

		Date, Place and Duration			
	Observation	**LEDET** (22/11/2013 and 08/05/2014) (total duration – about 14 hours within 4 days)	**SANBI** (18/12/2013 and 29/04/2014) (total duration – about 8 hours within 2 days)	**ESRI** (13/12/2013) (total duration – about 8 hours within 2 days)	**Purpose**
Observation taken at the incubants' workplaces	Organizational culture, e.g. artefacts, arrangements of offices, resources,	2.5 hours	2 hours	1 hour	To see the kinds of organizational cultures the incubants were exposed to and to see the cultures the incubants created in order to find or form their identities
	Mentor's way of instruction and interaction	30 minutes	0 minutes	30 minutes	To the kinds of techniques of interaction the mentors used which promoted learning
	What activities did the incubants do during working hours and outside of working hours e.g. lunch time	10 hours	4 hours	6 hours	To get a sense of what the incubants' experiences were like in their everyday lives at their workplaces
	Interaction of incubants with their peers	10 minutes every hour or so	30 minutes	30 minutes	To see the kind of engagement the incubants were involved with their peers which promoted

					learning
	Learning materials they used including GIS software	5 hours	2 hour	5 hours	To see the kinds of learning materials the incubants used which strengthen their GIS skills
Observations conducted during the induction training	Organization of the training e.g. venue, guest speakers, training program,	Every day of the 5 days of the induction training			To see how GS valued and respected the incubants. Also to see the kinds of skills, knowledge and competencies the GS intended to transfer to the incubants.
	Communication and interaction techniques used by GS and the incubants	Every day of the 5 days of the induction training			To see how GS valued and respected the incubants, also to see the response of the incubants.
	The induction training activities facilitation	The GIS expert presentation, the activity about the incubants finding their identity in the environmental sector, networking sessions			To see whose benefit the sessions serve and the kinds of skills that were intended for the incubants to achieve. Also to see the career opportunities presented to the incubants.
	Energy and enthusiasm of the incubants	Every day of the 5 days of the induction training			To see the kinds of opportunities the incubants grabbed, also to see their likes and dislikes of the training over time.

3.2.6. Document Analysis

Documents are written texts that serve as a record or piece of evidence, event or fact in the organization, reflecting diverse aspects of life in the organization and they occupy a prominent position in modern societies (Wolff, 2004). Thus this study used them as reference points or sources, also they were used to trace progress or capture information on events.

Document analysis was useful in this study for two reasons:-

- that some information did not require the stakeholders to offer insights into the project
- also they were useful for me as a researcher to see the full picture of the operations of the project plus more importantly they set a context for the study and assisted in the analysis processes.

It was important to examine the documents in the beginning specifically those concerning Groen Sebenza training; and the memorandum of understanding between the GS and host-organizations before data collection to see whether their promises were reflected in practice.

This section formed the part, **Layer 1 Analysis** (explained in figure 7) which was to establish the assumptions of the Groen Sebenza training as it related to the intentions of the internship programme to induct, support and orient young professionals into workplaces, and into workplace communities of practice. At the same time this section responds to sub-question 1.

In addition to the Groen Sebenza document analysis I analysed other documents (refer to the table below) that supported effective training in the Groen Sebenza internship project.

The following table presents the list of documents analysed and their purposes for analysis.

(a) Groen Sebenza training documents

Table 6 (a-d): Lists of the documents analysed during the course of the research.

Type of document	Year published	Author	Purpose of the document
The Groen Sebenza Incubator Framework and Partner Support Plan	2013	SANBI-Groen Sebenza; WWF; GreenMatter	The incubator framework
Incubator development and partner support plan	2013		Development, planning and guidelines for activities needed for the training
Groen Sebenza policy document Division: Biodiversity Education	2013		Policy on the Bursary Scheme in the Groen Sebenza Partnership Programme
Groen Sebenza policy document Division: Biodiversity Education	2013		Policy on Retention and Rotation of Incubants in the Groen Sebenza Partnership Programme
Groen Sebenza Project Weekly Communication letter	11 October 2013		Reminder about: - Quarterly reports - Time and attendance registers Engagements updates
Groen Sebenza National induction programmes for incubants	June and December, 2013		Content of the programme and key speakers in the programme and their impact on the environmental sector
Compilation of Lessons from the Para-ecologists based in the Eastern Cape with Rhodes University	2013		Success stories of the Groen Sebenza project
Groen Sebenza Performance	2013		Design and content of the progress report

evaluation of incubant template			
Groen Sebenza Skills needs ID analysis	2013		Competencies required for GIS practitioners
Groen Sebenza Guideline for the Induction of New Entrants into Ecosystem Management	2013		Suggested guidelines about the induction of the newcomer into different hierarchical organisational structures
A Human Capital Development Strategy for the Biodiversity Sector 2010 - 2030	2010	SANBI and Lewis Foundation	Intentions of how the environmental sector would want the newcomers and old-timers to participate in strengthening and transforming the sector
The *Groen Sebenza* (Jobs Fund) Project - Working Group 6 Meeting Presentation	21 January 2013	Malema V, and Fullard, D	Overview of the project governance structures, list of partnering organizations and the progress update
A Bridge into Work - The *Groen Sebenza* Jobs Fund Project Presentation	n.d.	Rosenberg, E	GreenMatter's perspective on: Environmental Strategy landscape, Environmental skills issues, Groen Sebenza Jobs Fund project, Supporting initiatives, and the way forward
SANBI Job Fund Application	Version June 2011	SANBI	Application for funding
Human Science Research Council	November 2009	Vass, J.R., Roodt, J., Wildshcut., Bantwini, B., and Reddy,V.	Guidelines for a Human Capital Development Strategy in the Biodiversity conservation sector
Priority skills for Biodiversity	March 2012	GreenMatter	2012 Update on scarce and critical skills.

(b) Minutes of Groen Sebenza meetings

Date	**Venue**	**Agenda**	**Key objectives**
28 November 2013	Biodiversity Auditorium , Pretoria	Incubator task team meeting (refer to appendix 13)	To discuss and finalise matters relating to the core functions of the Incubator Task Team

(c) Documents submitted by the incubants (or manager)

Type of document (s)	**Purpose**
CV	Wanted to check the competencies they bring to their communities of practice and to gain insights for setting up the context of their cases
Questionnaires	Wanted to get a bigger picture of the experiences in the Groen Sebenza by GIS incubants
Progress report/KPA	Wanted to see their developmental progress
Memorandum of Understanding between the incubant and mentor	Wanted to see the institutions' or mentors' expectations from incubants
Incubant placement and secondment of agreement between DEA and ESRI (*manager*)	Wanted to see the institutions' expectations from incubants

3.3. DATA ANALYSIS

3.3.1. Qualitative content analysis

As indicated in section 1.3. the aim of this study was to establish the experiences, interests, knowledge and value of the interns (prior to and during the training) and how these may be influenced by the training (This part formed **Layer 2 Analysis** as indicated in figure 7 – the study design and it was aimed to respond to sub-questions 2 and 3). To understand in detail and to gain a holistic understanding of the situation, qualitative analysis was deemed appropriate (Ferreira, 1988; Neuman, 2000; Van Wyk et al., 2006). Zhang and Wildemuth (2009, p. 11) argue that the results of qualitative content analysis "can support the development of new theories and models, as well as validating existing theories and providing thick descriptions of particular settings or phenomena".

There are numerous ways of analysing qualitative data; however this study used content analysis as it is a method suitable for analysing verbal or written communication messages (Elo & Kyngäs, 2008). The concept of content analysis has its origins in quantitative studies especially from the communicative field where large quantities of textual data was analysed systematically, to examine frequency, valency, intensity and contingency of text. These procedures however attracted criticism because they did show characteristics that would give the full picture of the phenomenon which includes latent meaning structures, textual content, linguistic foundations and its systematic nature lacked substantiated verification (Mayring, 2004). The procedures of qualitative content analysis (see section 3.3.1.1. below) were employed with the aim of examining the communicative material systematically. The important aspects of analysing the communicative material were to ensure that it was understood in its context and had to be of reliable quality. I used content analysis for those reasons but importantly I used it because it is suitable within the interpretive paradigm which provides a much deeper result than a quantitative content analysis. Researchers are able to identify emerging themes and describe social reality in textual data (Van Wyk et al., 2006) rather than providing statistical significance of the occurrence of particular texts or concepts.

3.3.1.1. Procedures employed for data analysis

The data analysis took shape in three steps (see details below). The procedure and interpretation was done manually in accordance with the coding systems of qualitative content analysis (i.e. NVIVO 9). I chose to do the procedures manually because I needed to immerse myself in the data in order to really understand the situations in their context as well as to allow themes to emerge from the data. It was helpful to know the data as when I was writing-up the interpretations I could always hear their voices and importantly I could always still feel their emotions. Hsieh and Shannon (2005) argued that it is through the degree of involvement of inductive reasoning that one can approach the qualitative content analysis (cited in Zhang &Wildemuth, 2009).

The qualitative content analysis was used to reveal the themes and connections (see details below). It is defined by Holsti (1969), cited in Babbie and Mouton (2001) as a method that can be used to make inferences objectively by systematically identifying specified characteristics of the data. For the purpose of this study conventional and directed qualitative content analysis was used because it was inductive and 'good' in establishing themes (Babbie & Mouton, 2001).

The table below shows the reasons I chose qualitative content analysis over quantitative content analysis. It is drawn from Zhang and Wildemuth (2009).

Table 7: *Difference between qualitative and quantitative content analysis (*Zhang & Wildemuth, 2009, p. 1-2*).*

Qualitative content analysis	**Quantitative content analysis**
Used to explore the meanings underlying physical messages.	Used to count visible textual elements but misses syntactical and semantic information embedded in the text.
Mainly inductive and attempts to generate theory	Is deductive and intended to test hypotheses.
Samples for qualitative content analysis usually consist of purposively selected texts which can	Requires that the data are selected using random sampling or other probabilistic approaches, so as to ensure the validity of

inform the research questions being investigated.	statistical inference.
Usually produces descriptions or typologies, along with expressions from subjects reflecting how they view the social world.	Produces numbers that can be manipulated with various statistical methods.
Deals with the forms and antecedent-consequent patterns of form	Deals with duration and frequency of form

3.3.1.2. Analysis process

a) First step – the transcription

The first step undertaken was that all interviews were transcribed verbatim. Afterwards the idea was to give the transcribed materials to the participants to see what was written accurately represented what they said (a process of member checking). However there were few challenges regarding writing word-for-word script, some of the challenges were as follows:

(i) If the interviewee was saying for example "But it is going to be tough here because my mentor doesn't specialise in GIS but he is very good in GIS" (Calvin 1). There are many pronouns used and sometimes it became difficult to trace what or who those pronouns represented, to make matters worse the conversation started and ended with pronouns so only the interviewer and interviewee would understand what they were talking about. And it would become difficult for the third person to understand.

(ii) Another challenge was that, during the interview the interviewee often used gestures to demonstrate or to explain what s/he was talking about, which was something that I could not write down. As a result when writing verbatim there were gaps in between words, phrases, etc. which did not make sense.

(iii) The other challenge was the grammar issue because for most of the interviewees English is not our mother tongue. So sometimes we would agree about the word

during the interview even when we knew it was not the right word but I would look for the appropriate word when transcribing.

(iv) Lastly, there were instances where the phrase “you know” and “I do not know” were mentioned several times in the interview, but they were said in different tones suggesting different meanings. For instance the interviewer may ask a question and the interviewee respond by saying “I do not know” meaning s/he does not know the answer, or “I do not know” meaning s/he knows the answer but the words are failing him/her to articulate it, or “I do not know” meaning s/he also has the same question and does not know why it has not been solved. When you write these “I do not know”, someone reading them would assume they had the same meaning.

These are some of the things I learned during the transcription of interviews which made me realise the importance of preparing my own transcripts so that I could immerse myself in the interview transcripts and using notes remember the tone and mood of the interview, so that I could represent what was said. So to overcome these challenges, I wrote nouns in replacement of pronouns, and next to phrases like “I do not know” I put the meaning in brackets, also in places where the interviewee was demonstrating with their hands, I wrote the meaning I received sometimes written them down in red ink. Afterwards I sent the amended transcripts to the participants for member checking to make sure that I had captured what was said accurately. In most cases participants were happy with how I had written down their views.

b) <u>Second step – establishment of themes or categories and developing a context</u>

Firstly I used concepts present in the CoP literature (e.g. interactions, learning, competencies) to use as themes/categories to analyse the data but not only that I also allowed other concepts which are not always addressed in CoP, concepts such as, financial independence, belief and spiritual fulfilment (i.e. for personal benefits/fulfilment), to emerge from the data. The benefits you get before the newcomer could identify with the CoP or even before the newcomer could participate meaningfully in the CoP.

I then developed relevant codes and categories for the analysis within the three layer process outlined in Figure 7 (see also below). Another step was that the themes were identified subjectively - but in a scientific manner- through the systematic classification process of coding (Zhang & Wildemuth, 2009). I used the following method to develop the themes:

- Firstly all the information was put in an excel spreadsheet.
- I started by putting similar questions with answers in one place, hoping to see trends. But it did not work since every participant answered the same questions differently and some answers were found in different questions. I then quit that process and started reading the transcript thoroughly to gather information without being guided by what the question was asking. It was not important for me to see how each question was answered but it was essential for me to check the kind of information that emerged from the answers.
- I read the first transcript and identified which information or data belonged to the setting up of the context (narration about the background of the participants – see Chapter 4) or belonged in the development of the themes (see Chapter 5). By so doing I was assigning codes.
- On the excel spreadsheet, I put the codes belonging to the background on sheet 1 and those for themes on sheet 2.
- After I had categorised the information, I looked at the information which was going to be used for the development of themes (sheet 2).
- I looked at the list of concepts that the LPP-CoP and the Capability approach talked about, I looked at which information was related to which concept, as well as which information did not suit any of the concepts. And if it did not match, I considered generating another important concept or theme.
- The themes were put in columns on the excel spread sheet.
- I repeated the same procedure with all the transcripts.
- Many concepts emerged as every participant provided different answers to the same questions. So because of the diversity of information, I then grouped all the emerging themes and looked at which concepts could form the umbrella concepts for the emerging themes which expressed almost the same message.

- I repeated this process at different times, in different moods and sometimes in different locations to see if the themes I developed stayed the same. On a few occasions the themes would change or I would re-categorise into different themes.
- I also did the same procedure with the documents and observations.
- When I was sure about the themes then I started to describe them.

Refer to Appendix 9-12 to see the examples that show how I coded data.

c) ***Third step – description and interpretation of the data***

Following the establishment of themes I (the investigator) described and interpreted them further. In this stage [i.e. description and interpretation], I discussed the interpretation of the data with the participants to avoid the "Springdale case" effect, which refers to the interpretations of a study that was published without the participants concerns being taken into account, and which had harmful implications for them (Hopf, 2004a).

Since the study was a multi-layered, nested study, I looked at which data responded to what layer or level of the cases. This information was used in the discussion section, Chapter 6. So I had layers/levels which included the Groen Sebenza training, the institutions, the department, the CoP, mentors and incubants. Each data was categorized and interpreted according to those layers/levels and at the same time it was categorized in such a way that it responded to the research questions and sub-questions.

d) ***Abduction and Induction***

Qualitative content analysis comprises raw data being condensed into themes or categories built on interpretation and inferences that are valid (Zhang & Wildemuth, 2009). Because qualitative content analysis is a process, it uses the induction way of examination whereby

the themes and categories emerge from the raw data. Apart from allowing themes to emerge from raw data Reichertz (1995) further argues that "the inductive processing of data consists of assembling certain qualitative features of the investigated sample in such a way that this combination of features resembles another (that is already available in the repertoire of knowledge of the interacting community) in essential points. In this case one can use the term that already exists for this combination to characterize one's 'own' form" (p. 303). Though the induction inferences and interpretations are not valid but a probable form of inference, their findings can demonstrate or explain issues of those who share the same community with the sample but were not under the investigation. Thus it can be used to verify assumptions and can find "new versions of what is already known" (Reichertz, 1995, p. 304).

Inductive reasoning did not help to explain data or the issues of the study, as a result I used the abductive way of reasoning. This process involves methods and logic leading to new ideas picked up by chance from new pieces of information (Minnameier, 2010). Hence "abduction leads to a new concept or theory that explains surprising facts, where facts can be anything that the epistemic subject takes for granted" (Minnameier, 2010, p. 241). Those new facts were important to explain the understanding of the internship training but also the old facts were important to bring them to the surface so that decision makers can start reflecting on them to improve the internship training.

3.4. ETHICS

Firstly, the study followed the ethical and legal requirements (including permissions) to conduct research that were aligned with the requirements of Rhodes University, involved organizations and participants (what Rhodes University's Higher Degrees guide and Rhodes University's course ethical texts). Ethics is about how the relationship between the investigator and the participants is handled (Hopf, 2004c). First and foremost, the terms and conditions of voluntary participation, confidentiality, and informed consent (refer to appendix 6) were attended to by making sure participants were willing to participate in the

research, and that they had a good understanding of the research purpose. In two sites the managers (LEDET and ESRI) agreed to the research. The research was clarified and discussed between the researcher and each of the participants at the start of the research, and I requested that they sign forms of consent to be involved in the research after they were clear about its purpose and their role in the research (refer to appendix 6). In the consent form I mentioned that I would not use their names, unless they wanted me to, in the study to ensure anonymity and privacy of participants. And that was a reason why all of the incubants agreed to participate. Because they agreed to be anonymous I also decided to keep the names of their mentors and managers anonymous to try to eliminate their vulnerability. To maintain the anonymity in terms of visual capturing I took photos of the participants from the back or at a distance where their faces cannot be seen properly. It was still difficult not to reveal what they looked like because those people who knew them well either from their workplace or communities might be able to recognise them.

Permission to record interviews, and to take photographs or other visual data (e.g. video recording of training session observations) was requested each time (as mentioned above).

3.5. VALIDATION/ TRUSTWORTHINESS

The practicality of the concept of validation in social sciences has been discussed by many researchers in qualitative research who agree that it may not be the best concept for qualitative studies (Whittemore, Chase & Mandle, 2001). Firstly, Golafshani (2003) drawing from Joppe (2000) explained validity in the context of quantitative research as a determinant of the truthful nature of the research result or it may also consider the accuracy of the research instrument used to reach the research object.

Trustworthiness is a more appropriate concept for qualitative research like this study, because the understanding of the phenomenon of interest cannot be manipulated nor be standardised nor even be conducted in a vacuum instead it unfolds naturally (Golafshani, 2003). Also the procedure to understand the phenomenon cannot be transferrable to another context or cannot produce the same results because the procedure is context

dependent and in most cases is subjective. The meaning of subjective refers to the fact that the researcher, regardless of how reflexive and objective they would wish to be, subjective judgement is inevitable (Whittemore et al., 2001). The efforts of researchers are also guided by the context and background of the surroundings in which the study is conducted, such as the scope of the research study e.g. sponsors of the study, their involvement and state of mind about the situation, their transparency of the findings, etc. (Golafshani, 2003).

This is also what the concept of CoP by Wenger advocates, that membership is negotiated through the efforts made by the person who wants to form part of the community. However the assessment of the trustworthiness of the efforts can only be judged by the members of the CoP which in the case of this study will be the examiners of this study and the research community who are interested in the study's findings. The efforts that are needed for ensuring trustworthiness include the contribution to the knowledge of the practice in the community and the 'honesty' and 'sincerity' of the researcher during the investigation and writing-up of the study.

The efforts I took to ensure trustworthiness in order to reach the objectives of this study were the following:-

- Conducting the interviews with the participants using audio recorders and in some instances photos because they can be listened to and viewed, repeatedly to preserve the integrity of the data (Bergmann, 2004a),
- I conducted observations of the incubants at workplaces and training sessions – where I also used audio recorders, photos and writing notes,
- I examined the documents, in some cases I photocopied them and in other situations the institution or participants would give me original documents.
- I further conducted member checking with the participants.

However in this study I found the concept of member checking in the context of a workplace overrated. For instance it assumes that the participants will always respond and make some amendments or agreements as per the researchers' request. But it is not always the case because again remember that this study was not regarded as a priority by the participants . So in many cases I would send the data back for member checking with an indication for responses and if none were received I would proceed. The worrying part was that I needed

to be ethical and respect their views as mentioned above; so it was difficult for me to interpret their views in an objective manner and I hoped that it would not in any way be harmful to them as per the consent form agreement (refer to appendix 6).

A key method I used to improve the trustworthiness of the study was triangulation. Triangulation is an approach originated from the land survey's field, but has been widely adopted in social science methodological procedures where it is applied differently (Flick, 2004b). Triangulation is about observing the research issue from at least two different angles using different sources of data. Flick (2004b) argued that triangulation is applied in different forms, which include the following:

1. Triangulation of data which combines data drawn from different sources of different contexts.
2. Investigator triangulation is about balancing subjective perceptions by using different observers or investigators.
3. Triangulation of theories is characterised by multiple theories to tackle or interpret data.
4. Lastly, methodological triangulation which entails a complex process of using multiple 'within' or 'between' methods to challenge each other with the aim of maximizing the validity of field efforts.

This study used triangulation in the first form - triangulation of data sources – generated through different methods as outlined in section 3.5 but used within the interpretive research paradigm.

To improve the triangulation of methods I also used theoretical triangulation as I proposed to work with Sen's capability theory to complement or expand Lave and Wenger's theory of identity formation in communities of practice; and internship concepts and theories to reflect on Lave and Wenger's idea of newcomers in communities of practice - as outlined in the Chapter 2. This added depth to the analysis which was also the purpose of the case study research (Fielding & Fielding, 1986, p. 33, cited in Flick, 2004b).

3.6. LIMITATIONS

I included this section because as much as I followed the procedures for conducting an interpretive qualitative-case study, there were limitations which affected the outcomes of the study. Those limitations were mentioned in almost every procedure of the methods described above of how I concluded the research.

In summary, the limitations were:

- First and foremost, it was difficult to avoid subjectivity
- Time was also a limiting factor especially during the interviews, because I had promised to interview for a particular duration and if the interviewee did not give sufficient information within the time given it was not easy to ask for an extra time especially that the participants had work to do.
  Though I made appointments in advance for the interviews, the participants often could not meet the appointment.
- During observations, specifically those at the workplace, s it was difficult to make a judgement on whether my observations were representing the 'truth' of the daily activities or not.
- I would ask for documents, for example weekly/monthly reports, and the participants would not submit them, despite putting deadlines in place. Because I needed to keep a good relationship and cooperation with them, I resorted to work with the few documents I received.
- During the observations I had many photos which were relevant; however it was difficult to select the few to use for the study.
- As much as I transcribed the interviews verbatim, it was not easy to construct the participants' story line-by-line or as a whole. Because sometimes telling a story from a 'whole' perspective might take the phrases out of context at the same time telling a story line-by-line might not make sense.
- Lastly, it was difficult to keep the participants completely anonymous.

3.7. REFLEXIVITY : My role as a researcher

My aptitude for planning and executing **t**his study were tested and in many cases challenged my reflexivity of how and what to write, plan, think and act.

The social events of the study need to be investigated as closely as possible; at the same time the investigator should be able to distance herself so that she does not only gather the understandings of the perception of the participants but also understands the underlying roots of those perceptions (Bergmann, 2004a). This required researcher reflexivity which involves an ongoing process of involvement with research participants and research context, and distancing to question the quality of the research processes and the meaning and rigour of the findings. Most of the steps I took to be reflexive were explained above. However one of the major roles I assumed as a researcher and a participant observer was to bring to light the restrictive conditions of what was known in the Groen Sebenza in an ethical manner. I also recognised I was as a learner as much as the participants were and in many cases I used their views to generate new ideas and correct my preconceived ideas.
Moreover because the data alone cannot make meaning except when the researcher has constructed a meaning out of different experiences of it (Lather, 1992), I have immersed myself in the data, analysing it from the outsider and insider perspectives, from whole and individual representations.

CHAPTER 4: CONTEXTUAL FACTORS INFLUENCING THE INTERNS EXPERIENCE AND EXPECTATIONS AND TRAINING

4. Introduction

In this chapter I present a description of the contextual factors influencing the interns' experience and expectations. By contextual factors I include

- the qualities which the incubants/newcomers brought into the communities of practices they inhabit; and by qualities I mean for example the educational background; work and lived experiences; future plans; their relationships with mentors and the institutions/CoPs; and the narration of the incubants' biographies (as case studies) which include the background of the roles they play in their families and their communities, and most importantly their valued being and doings
- the types of institutional structures and communities of practice they inhabit, with their challenges and successes. The institutions which the incubants occupied were found to be different in many ways, such as how their GIS departments operate and their mandate. Therefore they will be studied independently but most importantly for this study, I looked at the GIS CoP's and if it did exist, I looked at the type of GIS CoP and where they reside in the institutional structure. Also I looked at the institutions' understanding of the GS project (how and why the internship was adopted), and lastly
- I assembled and analysed the overall experiences of the first and second National Induction Training attended by all GIS incubants in December 2013.

The first two contextual factors were drawn from data collected via the interviews with incubants, mentors and managers; and the third contextual factor was extracted from the data collected via the evaluation forms submitted during the second National Induction Training as well as from the interviews with the incubants. Furthermore, I tried to organize the data in a sequence of how the activities took place to make sense to the reader, however there were cases where other activities overlapped. For instance the interviews

were conducted at a time when some GIS incubants had already attended the National Induction Training which took place in June and others had not.

It was appropriate to firstly provide insight into the context of where these incubants come from and live in so as to understand the roots of their perceptions and interpretations of their experiences of the training in their respective institutions/CoPs. Also it was important for me as a researcher and a writer to present the data in this order so I could analyse it in Chapter 6 where I discuss how each context can influence (or not) the incubants/newcomers to develop professionally and personally into becoming full participants of the communities of practice they inhabit.

I start with a summary of the background of the GIS incubants as they are at the core of this study's interest and I focus on their demographic background and the term of the National Induction Training each attended, just to comprehend the diversity of the individuals engaged in this study (see table 8 below). The column 'employment experience prior to GS project' is highlighted because it is considered an important factor that was often referred to (see Chapter 6, the discussion section), especially when responding to sub-question 2 of the study.

Table 8: Overview of the GIS incubants participants' employment experience, qualifications and the term of the National Induction Training attended.

Pseudonym	Gender/sex	Qualification	Majors	Organization	Employment experience prior to the Groen Sebenza project	GS Job title	Incubation Training attended
MacD	Male	BSc Honours (Univ. Fort Hare)	GIS and Computer Science	SANBI	1 year internship with NRF/DST in GIS	GIS Technician	June
Tumi	Female	BSc degree (Wits Univ.)	Geography and Geology	LEDET	Fresh from University with part time job not in GIS	GIS Technician	December

Calvin	Male	BSc Honours (UniVen)	GIS, Ecology and Resource Management	LEDET	Few months internship with DRDLR in GIS	GIS Technician	December
Tso	Female	BSc (UKZN)	Environmental and Engineering Geology	DEA – ESRI	Fresh from University	GIS Officer	June
Mosidi	Female	BSc (UKZN)	Natural and Environmental Science	DEA – ESRI	Fresh from University	Biodiversity monitoring and GIS Officer	June
Lebo	Female	BSc Honours (Wits Univ.)	Biochemistry and Microbiology	DEA – ESRI	Fresh from University		June

4.1. Case studies of GIS incubants participants

It should be noted that the following figures referred to as organizational-structures are constructed according to the information the mentors' and managers' description.

I. ***Starting with Environmental Systems Research Institute (ESRI)***: ESRI is a recognized organisation which specialises in providing GIS services and support which includes educating/empowering individuals with skills and knowledge about GIS and provides solutions to different organizations and individuals. Many organisations, including

SANBI and LEDET use its products to run their biodiversity planning.

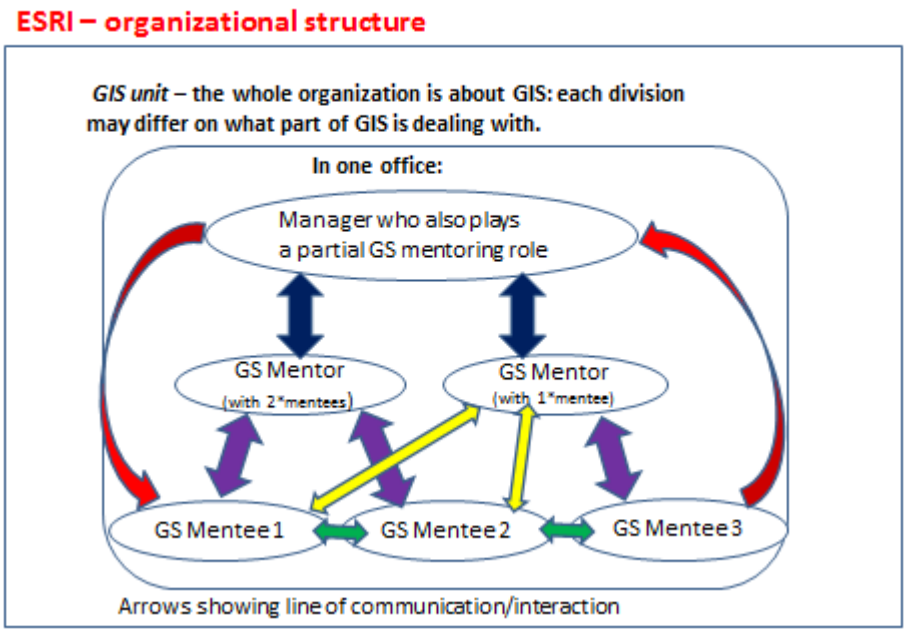


Figure 18: This is a sketch of the organizational structure that Mosidi (mentee 3), Tso (mentee 1) and Lebo (mentee 2) operated in. Mosidi had her own mentor whereas Tso and Lebo shared a mentor. The three of them shared an office with each having her own workstation. In addition the three of them were part of DEA business entrepreneurial programme in biodiversity using GIS skills. Their office was separated by a wall from their mentor's and manager's office. Their manager in the beginning of their appointment engaged regularly with them but as time went by her time spent with them became less and less. The GIS CoP was referred to as transformative, which means it was capable of redefining its environment and the direction of the organization, i.e. Relating to the rest of the organization, acceptance, managing boundaries (Wenger, 1998b)

Case Study 1: Mosidi

Mosidi was a young 'pedi' lady who finished her BSc Degree in Natural and Environmental Science with the University of Kwa-Zulu Natal in 2012. She was fascinated by computers and geography which was the reason she found GIS fitting to her pursuit of career. Immediately after completing her degree, she proceeded straight (i.e. no gap year or any temporary/part time job) into the GS project which started in May 2013. So she was a 'fresher' in a workplace environment. Because the vacancies in the GS project were in the biodiversity field, she became even more interested since they were her major subjects at University. She applied for many vacancies within the GS project and was only accepted by DEA for the

vacancy of Biodiversity Information GIS under the biodiversity business entrepreneurial programme. The idea of DEA's business entrepreneurial programme in biodiversity was to empower young professionals with skills and knowledge to start their own businesses and unlock jobs within the biodiversity sector using the GIS skill. She started working with DEA in May 2013 until August 2013 and she was then temporarily placed with ESRI (for about 10 months) to learn the elementary concepts of GIS and its functions. She was going to go back to DEA for the next phase of her business entrepreneurial programme.

Because she had been at two different workplaces she had different experiences. The differences she mentioned were as follows:

Her experience at DEA: She was exposed to REGENESYS business school which assisted her with enhancing management and leadership skills. She also mentioned that:

> Before I got into the GS project I didn't have any idea about anything in business (Mosidi 1).

In December 2013 she was partly informed about what the business industry entails. Other things she learnt were how to write a business plan and networking. Through REGENESYS she encountered people who were already doing biodiversity business in the sector. And through that experience she saw opportunities. However her challenges at DEA were that: there was no time which was explicitly set for her working hours; she did not have a work-plan, and no clear job expectations. Most of her time at DEA she spent attending workshops. In addition she was expected to submit a performance evaluation form from time-to-time which was not easy to do considering the work and reports that she needed to do for ESRI.

Her experience at ESRI: DEA placed her at ESRI because it wanted her to have a workplace experience in the field of GIS. She said that:

> I am loving the experience of being here (ESRI), being part of ESRI employees … and it is quite fun (Mosidi 1).

She felt she was better off at ESRI because she had a work-plan, she had someone to report to, she had tasks to do daily, and she learnt about a workplace code of conduct, which she did not have at DEA. She also said that:

> It is different now (at ESRI) because I have a proper job where I can wake up in the morning and I know where I should be at a certain time (Mosidi 1).

Although she had organized activities at ESRI, she said that they were not challenging (except at the beginning) because she would do the same things every-day.

One of her major roles to perform was to train ESRI clients about ESRI ArGIS products but she was teaching at the beginners levels of ArcGIS. In this training course she was taken to training courses about how to be a good and effective presenter and course facilitator where she acquired a certification for being a qualified facilitator. She was also given opportunities to do the practicals where she worked closely with other trainers (i.e. not necessarily her GS mentor) who monitored and evaluated her teaching and facilitating skills. Through this training course and the practicals she developed an interest of becoming a professional trainer of ArcGIS which meant that she needed to attend advanced courses to teach advanced levels of ArcGIS.

Regrettably, I did not get the chance to interview her a second time or do follow-ups to see how her progress unfolded because she got a job at a different institution. I was informed by her colleagues that she was in Kimberly, doing the GIS related job in the municipality. It would have been interesting to interview her to see the kind of institution/CoP she moved to and the kind of roles she assumed to see how her progress materialised and how far she participated in the GIS field was, but it was unfortunate that we lost contact.

Case Study 2: Lebo

Lebo applied for GS internship because she was unemployed for one year after she had graduated in 2011 with the University of the Witwatersrand, Johannesburg. She studied Biochemistry and Microbiology to Honours level and unlike Mosidi; she never studied anything related to GIS. So at her workplace they started by training her with GIS tasks which were simple and basic and she believed they were going to provide her with more complex and real tasks as soon as she grasped the fundamentals. Even though she did not have a background of GIS she never got unsettled because her mentor made things easy for her and was patient with her.

Despite the fact that she was appointed for a GIS job, it was not clear in the beginning what kind of job she occupied. She was called a GIS appointment and had no regrets about that title. So far, like Mosidi and Tso, she was exposed to many training courses related to business entrepreneurial skills in GIS which she found very useful. Also unlike Calvin and Tumi, she was welcomed in both institutions, DEA and ESRI. Her successes so far with the training were that she could apply GIS skills which she had acquired. And her challenges are that there is a lot of administration work expected from her from the Groen Sebenza, ESRI and DEA. I did not manage to conduct a second interview because she was on maternity leave and lost contact when she returned. I also heard from her colleagues that she was back at work and had a lot of work to do in order to catch-up the lost time during her leave.

Case Study 3: Tso

Tso studied Geology and majored in Environmental Sciences with the University of KwaZulu Natal. As an unemployed graduate, she applied for a GS internship. She was unemployed for about 9 months. Her passion was to work in the mining industry but she was not keen to work at the mines because of the violent protests and chaos which were happening in the South African mines at the time. So she changed her interests to occupations in the

environment sector. After seeing the job advert for the GS project she thought it would be good idea for her to try out the internship. Like Mosidi and Lebo, her GIS experience has to incorporate business qualities and skills. Thus she was exposed to many activities of GIS which she said helped her to be flexible. Also like Mosidi, she was had different experiences from the DEA and ESRI because each institution expected unrelated, sometimes complementary, deliverables from her. Her contract with ESRI was from August 2013-July 2014 (12 months). The main challenge she faced as far as business was concerned was that she did not:

> Think after 2.5 years I will have enough expertise to start a business but I can get a job … because you know when I look at the GIS related job adverts they are looking for the kinds of skills that I'm acquiring now … hopefully when I get out of here I will get a job without a hassle (Tso 1).

Though Mosidi, Lebo and Tso were in the same programme, they were involved in different projects. At the time of the interview she mentioned that everyone in her household was happy because:

> They know that I'm working and I'm in this program that will help me start a business … you know at home they are not really … they just want me to get a good job and make money … you know …t hey think starting a business is quite risky … but I explained to them that we have a lot of help and I'm confident that I can pull it off (Tso 1).

So she was experiencing the family pressure of proving to them that her career as a business entrepreneur in biodiversity could prevail on the other hand she had expectations from GS and DEA to acquire not only skills to be employable like other GS incubants, but also to acquire skills and knowledge that will enable her to open a business after the internship. However despite these stresses she still believed that she could pull through because of the exposure to different business related activities [such as attending seminars about sustainable development, financial business learnership, green economy opportunities, opportunities to team-up with other incubants who have similar business ideas or creating networks with other incubants, etc.]. She had contacts at DEA which also allowed her to be flexible. Though she was introduced to business related activities she still relied on ESRI to

learn the GIS related skills to complete the qualities needed in the business industry she wanted to pursue. She was working at the data services department at ESRI where her roles were to assist her colleagues with data collection, searching for data sometimes from the census data, processing data and creating it. Sometimes she would volunteer to work with projects about the imagery because she enjoyed working on them and her mentor also knew about her passion for imagery and she encouraged her to work on them.

She was happy that she is learning a lot about business however learning from the business training she had received she still feared that it might not be enough because:

> On the other it's not easy to start the business in the environmental sector because you have to be very educated and have a lot of experience … for now I will just side-line the business thing so I can go study further and acquire more experience and later that is when I go back to business side of things (Tso 1).

The next phase of the DEA-entrepreneurial learnership was to go to the Innovation Hub where they help them with writing a business plan and evaluate the viability of their business ideas.

Her future plans in the internship were

> "I don't want to be an intern for the whole of 3yrs….I think I will be ready to take on responsibilities before the 2.5yrs end" (Tso 1).

She also mentioned that Lebo and her share the same office and mentor with another intern from a different internship programme (perhaps SETA) and so far she had not seen any dissimilarity in treatment from their mentor. Most of the time they perform the same activities however sometimes the new intern would go to the development unit because her focus was on Information Technology.

II. SANBI – Pretoria

SANBI has several functions amongst them is implementing the national biodiversity mandate. Within that mandate, amongst other objectives indicated on the diagram below, its objective is to provide information, policy and planning services in which BGIS unit and

GS internship training (this study's interest) are embedded. SANBI is a parastatal institution.

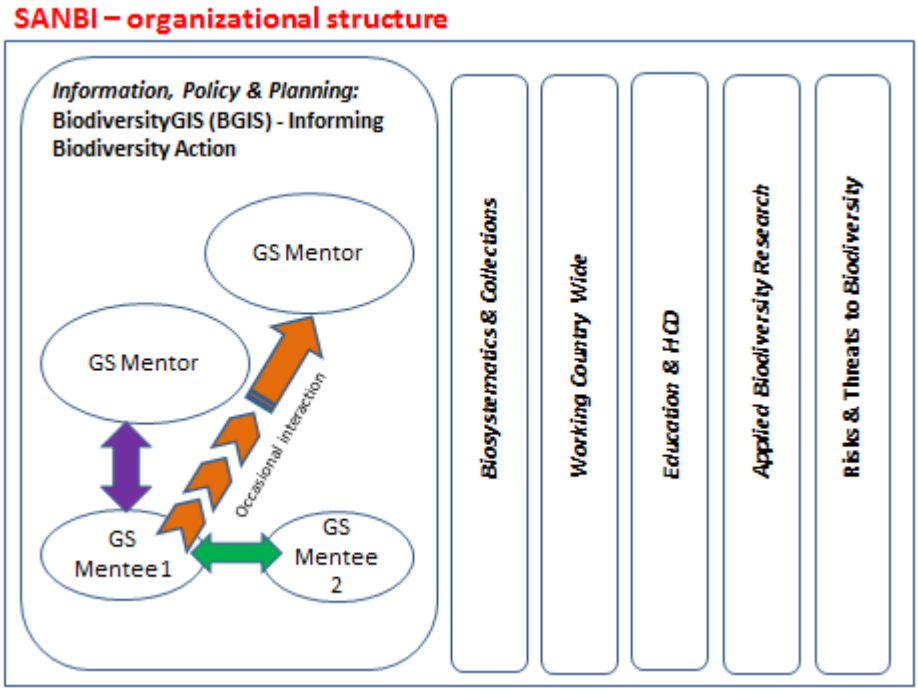


Figure 19: Mentee 1 in the diagram represents the GIS incubant (i.e. MacD). He had a 1:1 relation with his mentor but does not share the office with his mentor. He shared the office with only other GS incubants, so he also had access to interact with them more often. The BGIS unit at SANBI can be regarded as legitimized according to Wenger (1998b) because from the data it resembled the same characteristics that are regarded as "officially sanctioned as a valuable entity" and it entailed "scrutiny, over-management and new demands".

The BGIS unit falls under biodiversity mainstreaming and policy making. So its mandate was to conduct GIS analysis for conservation planning purposes and bioregional plans and feeding them into strategies such as national biodiversity assessment. Thus most of the GIS work, such as the maps which are normally found in the scientific reports about policy development for biodiversity in South Africa, and especially the work conducted from SANBI are done by the GIS teams. The team or CoP that the GIS incubant inhabits deals with freshwater related activities, such as everything related to water for conservation planning e.g. rivers, wetlands, estuaries, etc. (Thoko 1).

Case Study 4: MacDonald (MacD)

MacDonald known as MacD is a young man from a village in the Mthatha vicinity in the Eastern Cape. He acquired a BSc Degree in GIS and Computer Science and in 2010 he completed his BSc Honours in GIS and Remote Sensing with the University of Fort Hare. During his studies he worked part-time in the University as a computer science tutor and computer technician. In 2011 he looked for a job and did not succeed until 2012, where he enrolled in a one year DST-NRF internship at SANBI, Pretoria. He assumed the role of GIS Technician. He became part of the National Wetlands Indaba project 2012 and produced a poster for the conference. However the contracts finished before the project ended (i.e. March 2013).

He was fortunate that when the GS project came into effect in 2013 his contract was restored and he continued with the roles and responsibilities he assumed while he was still with the DST-NRF internship. This was a big milestone for him because:

> Before I joined Groen Sebenza … I had basic GIS knowledge and wasn't really exposed to practice/field work … basically I had theory and now I joined and am exposed to the field and I have done projects (i.e. working for water program) … so I now have something concrete than before (MacD 1).

The SANBI team:

> Were happy that I am back and were worried about the contract that ended and left me nowhere (MacD 1).

So he had a chance to finish the wetland project and could even engage in other training such as the

> Environmental ecological infrastructure training, to learn more about the wetlands so I can enhance my experience and learn more about the field (MacD 1).

He applied for a GS internship so that he could enhance his GIS experience, but primarily because:

> I can have something to do rather than staying at home doing nothing … applying for jobs … getting stressed … so GS came to a rescue by giving us this opportunity to actually develop our skills and being exposed to many things, meeting new people, network, etc. and gaining experience (MacD 1).

He was promised he could attend ArcGIS with ESRI the following year in the beginning of 2014, which he did and was endorsed with a certificate recognised by SAQA. The training course was sponsored internally by the GIS unit at SANBI.

III. *Limpopo Economic Development, Environment and Tourism Department (LEDET)*

LEDET is the provincial government institution and is the one hosting the most number of GS incubants, about 121 GS incubants. It consists of three main divisions which are 1) Economic Development, 2) Environment and 3) Tourism. The following diagram is an illustration of how LEDET is divided.

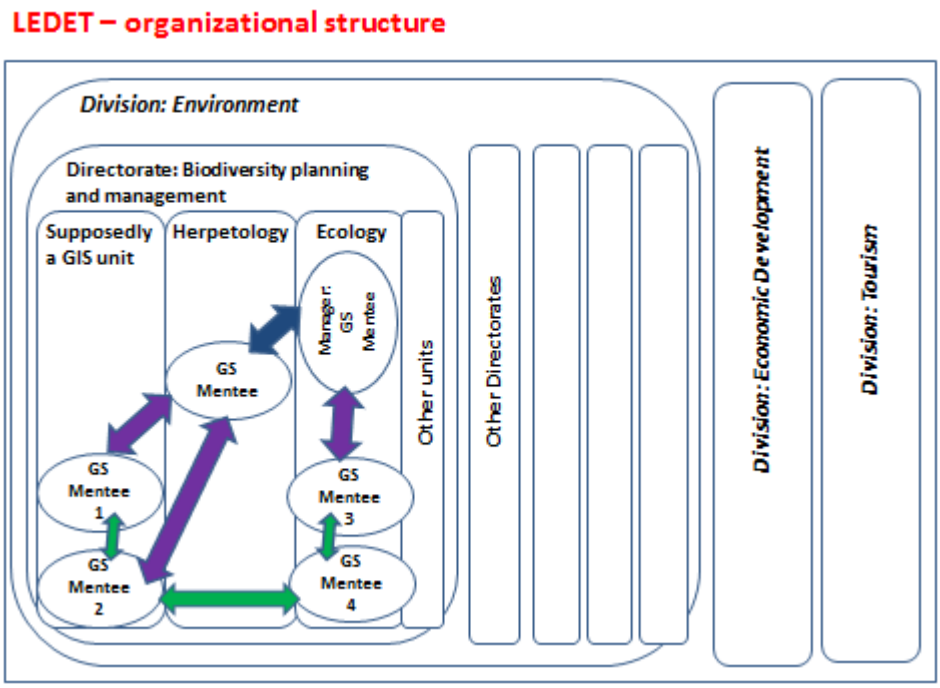


Figure 20: Mentee 1 and mentee 2 represent the incubants of this study's interest. They share a mentor who is not specialising in GIS but herpetology. Arrows indicate who they interact with in the department. According to how the GIS unit was described by the manager and mentor, this unit qualified to be referred to as bootlegged. Because apparently the GIS unit was not necessarily recognised by the institution as a

stand-alone unit, it is "only visible informally to a circle of people in the know" (Wenger, 1998b). Even though it does not have resources and is hidden, it still has an impact on the work of other members in other units.

Of all the host organizations partnering with SANBI for GS project, LEDET was allocated the most GS incubants and it had the least capacity in terms of mentorship as far as the biodiversity directorate at LEDET was concerned (Kevin pers. comm, 2013). As mentioned above LEDET consists of three different but related divisions which include Economic development, Tourism and Environment. So within the division of Environment there are different directorates in which Biodiversity planning and management are located. Within the Biodiversity planning and management directorate, there are different research units which include ecology, herpetology and a "supposedly GIS unit" in which 10 incubants were distributed (refer to the diagram above). In addition to 10 GS incubants there are two interns who are not part of GS but form part of the interns who get appointed annually through the LEDET annual internship program. The GIS unit was stated as "supposedly" to exist but it had no one who was dedicated and specialised to be a directing head. All the directorates use GIS tools but are not experts except for Treve (the GIS mentor) who happened to know a lot more about it because he was fascinated by it. However there used to be someone who coordinated the GIS unit but he was also not a GIS specialist but a nature conservation technician. He was self-taught with GIS over the years and ended up coordinating the GIS unit and he resigned four months or so before I came to interview the acting senior-manager, Kevin. Since then the GIS post had not been replaced. Nevertheless there is a Research and Planning directorate in the department which Kevin speculates might have a GIS unit because in his own understanding planning would require GIS skills or GIS tools which might have been appropriate for the GIS incubants but he suspected that it might still be lacking. There was a point where their unit needed a GIS expert to conduct EIA and conservation planning to check the sensitivity of specific areas and they had to outsource the expertise because they did not have the capacity (Kevin 1).

The Biodiversity Planning and Management directorate has six key performance areas in which spatial conservation planning is one of them and this was where the two GIS incubants, Tumi and Calvin, were situated. There was also a key performance area where they deal with scientific reviews and assessment where people apply for permits and apply

for environmental authorisation for EIA. This was also a space where the two GIS incubants were inducted and assisted the unit with the reports. Other activities were about spatial species conservation programmes, wetlands surveys, river health, and reptile projects that the unit tried to get them involved in.

Intentions for adopting Groen Sebenza: According to Kevin and Treve their understanding of how the Groen Sebenza project was adopted was the 'easy' way of addressing the job gap (vacancy problem) and personnel occurring within their directorate. The organization assumed that the Groen Sebenza incubants appointed would do the actual job independently without needing to be mentored and trained. And it became a problem to their directorate because they did not have experts or mentors in the areas where these incubants were appointed. As Kevin said:

> There were one or two people here who basically planned the whole thing … I remember when this thing (GS project) first came up we were told that it was a job fund project … we were told that we were going to get qualified people … because we have a high vacancy rate 75% ... qualified people who are going to be appointed in the vacant positions but the salaries are not going to be paid by the department but will be paid by the national job fund and the project will take 2-3 years period … now you can imagine everybody was happy that at least now we are going to get people in those vacant positions and our lives are going to be much better now because those vacancies will be filled … when it happened it was not what we were told … suddenly we received students who were not qualified and not experienced to do the job and vacancies were still open because they were not part of the establishment … they sat outside the establishment … so instead of receiving qualified and experienced people we received inexperienced and sometimes unqualified people or people who are not qualified enough because some of them they don't even have an Honours Degree they are still with just BSc Degree … so all those dreams of filling up all the vacancies became a nightmare … because we still had a vacancy gap and few people who remained must now address the new inexperienced people … that's where the problem came in … (Kevin 2). I think there was a misinterpretation or a misunderstanding from the people who managed this process in the beginning … don't think they fully understood the consequences of

> this programme … and what it will actually take from the department to be able to accommodate and address the need of these interns that they are going to receive ... (Kevin 2). We do ask about how other divisions are doing outside of our directorate and "even in these mentor engagements or discussions that we have … because in other directorates they are not so specialised they basically used them for anything … it's not like our division … I mean if you have a diploma in nature conservation, you can work in the [game] reserve, hunting section, etc., it doesn't really matter but for us it's not the same (Kevin 2).

Another reason they bought into the GS idea and committed to it was that the project was a 2.5 year plan. For that reason they might be able to retain some of the incubants. Because the directorate is understaffed, apparently there were three scientists where there are supposed to be ten (and two technicians), they were prioritising increasing the number of scientists such as ecologists and specialists rather than having more conservation planners (Treve 1). Even so, in terms of informatics they would need conservation planners and database management officers.

In the beginning of the project the staff was:

> Basically trying to use them wherever we can in terms of the programmes and activities that we run … but it's not 100% effective because of these challenges [mentioned below] (Kevin 1).

> So far the department has been sending the interns without our knowledge … it's a question of … you get a knock on a door and two people walk into your office and they say they have been appointed in your directorate as interns … and you just say oh ok … tell me about yourself, what do you do, what are your qualifications … often you find that … for instance one guy, the last one we had … when we asked him 'what's your interests and what do you want to do'…. he said he wants to work in forensics and wants to work in the laboratory and do forensic science ….I said that's not what we do … forensics has to do with law enforcement people …. so the department doesn't always know correct places to put these interns … they hear conservation, biodiversity or environment and if it is something that's on the interns degree then they think s/he is the right person….and we all know that it doesn't

work like that…it does not mean if you have the environmental degree it doesn't mean that you can work as a zoologist or botanist … people don't understand the differences … (Kevin 2). The problem with us is that for example if you have a diploma in conservation it is a general qualification … you can work in the nature reserve or permit office, etc., you can be utilised almost in anywhere in the conservation arena ….but in our directorate it's different … you are qualified in a specific discipline … for example if you have Honours in Botany, you are a Botanist …y you register as a professional scientist under the field botany … that's what you do you don't do other things because you are not qualified for them … if you have a degree in wildlife management, you register with SACNASP, the registration board, as an ecologist … that's what you do, you can't send an ecologist to do EIA, or permits, because they are not qualified for that … and that is why in this directorate we work with specialists … and you can only add value to that specialist if you have another specialist who can mentor you (Kevin 2).

Challenges faced by the Biodiversity Planning and Management directorate (in the first semester of the GS project):

(i) The directorate went through quite a lot of changes. Apart from the issues that their directorate has, amongst them and the most significant one which Treve and Kevin emphasised was that their directorate was understaffed meaning the staff was supposed to be around 27 in number, but there were only 5 and in addition to that their mandate has increased.

(ii) They cannot achieve or use the one-on-one mentorship approach that GS expected of them instead they have three incubants per mentor.

(iii) because of the reasons mentioned above:

We aregetting stressed because we are doing jobs of many anyway … so time isn't really there … we don't have luxury of being able to call a meeting every Monday or to have a little talk with incubants … everything is desperation stuff, running around (Treve 1). So imagine we only have three scientists,

they don't have time (to do their own work) and they have to take the little time they have and dedicate now to mentorship as well (Kevin 1).

(iv) They do not have GIS specialist mentors or a Botanist mentor (but have received GIS and botanist incubants).

(v) In the beginning the GS project was adopted because:

> I get the impression that these people (operational unit of the department) were not really properly informed that this GS project is now being adopted by the department and that we will get all these students and must provide for them … and when these students arrived it was all kept within the Environment branch … because if you go to the departmental HR and seek for offices for the students, they (the HR) would ask who are those people? It shows there was a very bad communication between the environmental branch and the rest of the department …. apparently what happened recently was that … I think the Head of the Department realised that there was a problem in terms of how this GS programme is managed … because we wrote many complains and reports … so they now appointed a task team in the department that consists of representatives from IT, HR, etc. to try to solve the situation … but we are already 7 months down the line which is the time that was not used in the best way … I just think it was very badly managed from the start (Kevin 1).
>
> Ms Vuyi Thabethe was then later appointed as the GS coordinator in the directorate after three coordinators resigned because they said they can't coordinate GS programme as its challenges were overwhelming (Kevin 1).

(vi) I think it is the interaction between GS programme and our department (was just poor) … and who exactly made a mistake I can't tell … but the fact is that things were not addressed efficiently before these people arrived … in the end those people (the department's management and GS) will not face the youngsters but I am the one who have to face them … tell them that sorry I don't know where you are going to sit because there is no space for you … they didn't tell us that you are coming … which I really find very bad … I feel it's unfair for these young people who have all these expectations … and should be exposed to a positive environment where things are working (Kevin 1).

(vii) We try to make them work with us on that (permits reports) … but we have 14 days to react to the application we receive … and normally we do 40 to 50 per quarter … so in other words all the teaching, editing, sending students up and downs causes the process to be delayed, it takes much longer than when you have an experienced professional doing (Kevin 1).

Challenges faced by the Biodiversity Planning and Management directorate at LEDET (in the second semester of the GS project):

(i) things are still the same … us not having mentors … we still not able to appoint an additional person … we have come to the stage where we already shortlisted people for appointment, mentor, but then it was stopped again because of HR problems … so we've not been able to appoint anyone … so the issue of mentors is exactly the same … currently we have 4 mentors here … those mentors share the GS people … so they have between 2 and 3 interns reporting to them

(ii) but again the existing mentors are not necessary qualified in the same positions as in which the GS interns are appointed …in n other words we have 5 GS ecologists but they don't report to the ecologist mentor because we don't have any …t hey report to the wetland person and reptile person…so that situation has not been resolved

(iii) the second issue is the budget … I mean it's been a year now that the GS intern have been appointed and as far as I know we have not received any funding yet, we have not been able to spend one cent … from what I understand the problem there is that money that needs to be transferred from SANBI into our department's budget and there seems to be problems as to how that must happen

(iv) another problem is that if that money goes into the big budget of the department how does it filter down to different directorates and divisions where these interns actually sit so that they can receive their R66k per year, that hasn't happen ... so we submitted equipment needs and training needs to the GS coordinator but her hands are also tied she can only do so much (Kevin 2). If the

> department decided to sign an agreement to take these interns … right from the beginning it should have told the HR to take care of issues that they do access card personnel numbers etc., logistics-make sure the interns have place to sit and workstation, IT-make sure the interns have internet access laptops or at list computer stations … everybody should have had their job … so that when the interns arrive everything would be in place … so to sum it up I think the planning and preparation were not done well and that's why we have the results we have … and there is no other explanation I can think of (Kevin 2).

Furthermore Kevin mentioned that in addition to 10 GS students there were two departmental interns who were not part of the GS but were essentially doing the same things. These interns were students who are employed on an annual basis and get paid by the department.

Case Study 5: Tumi

Tumi is a young lady from Mokopane, Limpopo. She was born into a family of three and she is the oldest. She completed her BSc Degree (majored in Geography and Geology) in 2011 with the University of the Witwatersrand, Johannesburg. She graduated in 2012. After she finished her degree in 2011 she searched for jobs in the geology field and was only able to get a part-time job where she said "it wasn't hectic geology stuff but it was just basics". Not only was she applying for jobs in geology but also in GIS. January 2013 she saw the GS vacancies which included positions for GIS. Initially the idea of applying for a GIS vacancy was to 'try her luck' and again she knew she did not have a chance of being appointed since the GIS vacancy was embedded within the Environmental sector which she did not have any experience of. She applied for the GIS vacancy anyway because the environmental sector sounded interesting. Her application was successful and she was called for an interview in March 2013 and it was only in July 2013 that she was told that her interview was successful. At that time she was still doing her part-time job.

Her interest has always been geology as she said “geology is my first love”. Well she did enjoy geography at school but she enjoyed studying about rocks more, however, since she found GIS interesting she was planning to combine the two fields for her future career.

In the beginning of her GS internship things were not interesting because she had a mentor who was too busy to give her time let alone to teach her anything about GIS. After a while her mentor resigned and she “luckily” as she said got close to Treve, who then later became her mentor. Treve was an employee of LEDET in the Biodiversity Planning directorate who fortunately knows a lot about GIS even though he is a herpetologist. Ever since then her love for the environmental sector especially biodiversity and conservation has grown and her perception of it has changed. Now she could see how her passion for geology and GIS could work together in the environmental sector.

She travelled every day to work from Mokopane but it wasn’t a pleasant experience for her because Mokopane was far from her workplace (which is in Polokwane) and she was planning to move closer to town. Initially her future plans were to apply for Honours degree but she was not sure if she wanted to specialise in Geology or GIS, but eventually she had to settle for GIS because her current line of work was GIS based. So she wanted to develop her skills and knowledge in GIS and excel in it. However she said:

> My dreams have changed … but my main goal was to get something in geology … I have not abandoned it (geology) … for now my short term dream is to focus on GIS.

And her main interest at that moment “was the whole thing about conservation planning”.

Case Study 6: Calvin

Calvin is a young man from a village in Thohoyandou and is the last born in his family. He said that because was from a family of boys and he was the only child who managed to study to University level and he always knew that there was a lot expected from him by his family. His father passed away when he was about five years old. He just wanted to be successful in life and could not allow anything to stand in his way. His mother

> Is very spiritual, religious and motivational … and she always instructed me to do the right things ... I always felt special because of that … so she always made me feel special … so I didn't want to disappoint her … also I had a friend who motivated me in high school … we grew up together since forever (Calvin 2).

Calvin finished his BSc Honours in Environmental Science specialising in GIS in 2012 and graduated in May 2013. He studied with the University of Venda. He then enrolled into the internship programme at the Limpopo Department of Rural Development and Land Reform. He was an intern doing GIS focusing on spatial planning. Applying for the GIS vacancy in the GS internship was an opportunity to him because it focusessed on environmental management which was related to what he studied for his Honours degree. Another reason that motivated him to apply for GIS GS internship was:

> To improve on the years of experience so I can be marketable and assume a 'proper' job … because GIS requires a lot and one need to register with professional bodies … and I thought it will benefit me with that regard (Calvin 1).

He started his GS internship in October 2013. When I conducted the first interview he had only served a month in the project and at the second interview he had been there for six months.

His experience as an intern at the internship before GS was that he had a supervisor who was specialising in GIS and he believed he learnt a lot of GIS skills more than what he was learning in GS. He learnt a lot because unlike at GS he was busier with tangible activities and was also able to do fieldwork.

Nonetheless he mentioned that even though he did not have much experience which he could really talk about but the only thing he could mention was that:

> Groen Sebenza helped me financially, looking after my younger brother and my family,… you know I'm the only one in my family who was able to acquire a tertiary education … so it's been good because I'm able to assist at home with grocery and some stuff wherever I can (Calvin 2).

He also mentioned that:

GS has changed his love-life … you know even if it's not much but when you are in the village, at home, you look different from other people … because you wear differently … so women or ladies start to look at you differently … the village I come from is big and it is divided into sections, so the section I am from … they live a very tough life … guys there do not go to school … so I do look different … not many people reach to the tertiary level and there are many factors causing that … for instance they start experimenting with illicit substances … early in their lives … such as drugs, alcohol, dagga and especially dagga … and those who make it to grade 12 can't make it to tertiary because there is no access to information on how they can get funding … it is a big problem … so that is why there is a need for people like us who are informed to tell them this information (Calvin 2)

4.2. NATIONAL INDUCTION TRAINING

4.2.1. Introduction of the National Induction Training

There were two National Induction Training sessions which took place in June, 2013 and December, 2013. I only managed to attend the second National Induction Training in December, 2013, from which most of the data was drawn from. I described this event because it responds to sub-question 1, 2 & 4 of the research study. I did not manage to attend the June 2013 induction training because the study was still in the inception stage and I needed a better understanding of GS project so that I could plan my data collection.

Though most of the activities which occurred during the National Induction Training were found to be useful and relevant, I was needed to make radical decisions on which information to use. I was required to be more careful (rigorous) and critical when selecting the data/findings so as to represent the message that this study intended to convey. This section will follow the following sequence:

- ✓ why the National Induction Trainings took place and how was it important for the study,

- ✓ how the programmes were structured during the National Induction Training,
- ✓ how I, as a researcher, observed the participants and the whole process during the second National Induction Training.

4.2.2. Reasons for the occurrence of the December National Induction Training

The National Induction Training sessions were led by a task team which were supported by the SANBI-Groen Sebenza team. The task team consisted of leaders/coordinators who were not only from SANBI but also from different institutions, for example, leaders from the DEA and Department of Environment and Nature Conservation-Northern Cape (DENC-NC).

The reasons for setting up the induction Training were as follows:

- Firstly, the induction was the initial phase of the incubation model which Groen Sebenza was using,
- to introduce the incubants to the Environmental/ Biodiversity sector,
- to inform the incubants about the history and establishments of GS, its motives and values,… also how SANBI is involved,
- to highlight distressing issues of our society such as HIV/AIDS,
- to advise, update and inform them on the technical skills (e.g. project development and management, law enforcement) required for the occupations they assumed in their respective organizations,
- also to advise, update and inform them about generic and life skills (e.g. communication and networking, workplace ethics and professionalism, financial literacy),
- last but not least, to create a learning space, reflections for both the incubants and the GS team, for the development of the GS project and personal development.

All the above mentioned factors were important for this study. The aim of the training was to prepare the incubants mentally for the biodiversity sector in general. This was vital for the incubants to start identifying with the CoP they wanted to inhabit. Another factor was to start the GS project with uplifted spirits and hope by saying ‘all is possible but needs to be earned’.

As mentioned above that there were two national induction Training sessions, initially though the aim of the GS project was to have only one, which was supposed to be held in June 2013, but the need to hold another one in December arose due to the following reasons:

- The delay of commencement of appointments for some incubants in different host organizations, most did not start when the GS project started which was in May 2013, therefore it was necessary for those who were left behind to have their own induction. This was because after one on one interviews with the incubants after the June induction training (interviews conducted by different organizations e.g. WESSA), many incubants shared the fact that the June Induction Training was a life-changing experience. They felt a connection to the GS project and stated that the induction Training gave them direction about what they needed to do at their workplace and in their own personal lives. For that reason, the GS team felt it only fair to give the "late comers" an opportunity to experience the Induction Training.

Hence, the GIS incubant participants of this study did not attend the same induction Training. Incubants from ESRI and SANBI attended the June incubation Training and those from LEDET attended the December one.

During the December national Induction Training many activities occurred regarding professional and personal development and every activity had its own method of operation. For instance there were small group discussions about 'what it means to be an effective employee', where incubants also shared their experiences, successes and difficulties.

The following programme (see table 11 and 12) and description of the December national Induction Training indicated what the training contained. I firstly share the programmes of the two induction Training sessions to see if the two groups of incubants were given the same starter to ensure they both received the same experience.

4.2.3. Overview of the National Induction Training programmes

4.2.3.1. Similarities and differences between the two programmes

Table 9: Table showing the differences between the two programmes for the induction training.

June Induction training	December Induction training
It took five days.	It took four days.
On the fifth day, the incubants had the Minister of Environmental Affairs, Ms. E Molewa, as a keynote speaker and the mayor of the city of Tshwane.	These guests were not invited to speak.

Besides those differences, everything else including the venue was the same except that some of the activities did not occur at the same time or day or the guest speakers were different but were from the same organizations.

The first national induction Training was held from the 4th of June to the 8th of June, 2013 at Birchwood hotel and conference centre in Boksburg, Johannesburg (Gauteng Province).

Table 10: The following table shows the programme for the first National Induction Training .

Table 1: The following table shows how the programme for first National Induction Week looked like:

Tuesday ***Day 1 (4 June)***	***Wednesday*** ***Day 2 (5 June)*** ***Planning my future, my career***	***Thursday*** ***Day 3 (6 June)***	***Friday*** ***Day 4 (7 June)***	***Saturday*** ***Day 5 (8 June)*** ***Groen Sebenza Project Launch*** ***Venue: Pretoria National Botanical Garden***
Registration (1hr)	Reflection on day 1 - Incubants (1hr)	Reflection Day 1 By programme director (1hr)	Reflection By programme director (30min)	Arrival of guests (2000) (30min)
Welcome – Programme Director: Ms Carmel Mbizvo (DDG: SANBI) (15min)	Understanding the World of work and Cultural diversity in the workplace.- Mr Jimmy Khanyile (1hr)	Planning my future – Career (Full day session) By HARAMBE	Living a balanced life/Healthy Living By ICAS (1hr30min) Health Screening By GEMS (Full day session)	Welcome and Introductions By Mayor of City of Tshwane (15min)
Induction into the Sector - Dr Moscow Marumo (Chief Director: DEA) (30min)				Setting the scene By Dr. T. Abrahamse SANBI CEO (30min)
How does SANBI fit into the sector? Ms Kristal Maze (Chief Director: SANBI) (30min)				Entertainment (15min)
Motivational Speaker - Mr. Sam Tsima CEO COMETSA (1hr 15min)				Groen Sebenza Incubants (30min)
TEA (15min)	**(30min)**		**(30min)**	Entertainment (15min)
What is Groen Sebenza? - Dr. Tanya Abrahamse (CEO: SANBI) (30min)	Understanding the Incubator model.- Ms Vivian Malema (SANBI) (30min) Incubator Model: An Entrepreneurs perspective [Q & A]- Mr Thomas Mathiba (DEA) (30min)		Resource Management (Managing finances, budgeting, what options are available) by OLD MUTUAL (2hrs)	Key note address By Minister DEA: Hon Min E.Molewa (30min)
Stakeholder Perspectives – • Mr J. Mkosana (NMBM) • NCC (Mr Dinisizwe Gudlindlu) • INDIGO (Ms Bettina Koelle) (1hr 30min)	Planning my future – my career • Biodiversity Information Management • Horticulturalist • Community workers Education and Communication Conservation workers • Environmental management & Business development • Hospitality workers • Research Scientists • Enforcement and Regulatory officers By Rachel Balie And Break away sessions. (1hr)			Entertainment (1hr 15min)
LUNCH (1hr)	**(1hr)**	**(1hr)**	**(1hr)**	Media briefing (30min)
Branding and Networking - Mr Karl Smith (Business Networking SA)	Planning my future – Conversation and q's By Groen Sebenza facilitators (1hr)		MIE Vetting (Full day session)	Closing and Lunch Vote of Thanks – SANBI Board Chairperson (1hr)
Reflection (Incubants) - Individually or groups. (3hrs)	**TEA BREAK (30min)** Planning my future – Questionnaire By Groen Sebenza facilitators (1hr)			DEPARTURE
	Reflection (Evaluation) (1hr)			
SUPPER			**SOCIAL EVENT at Conference venue**	

Table 11: The following table shows what the programme for the second National Induction Training looked like.

Table 2: The following table shows how the programme for second National Induction Week looked like:

Tuesday *Day 1 (03 December)* Programme Leader: Mr Donovan Fullard (SANBI)	*Wednesday* *Day 2 (04 December)* Programme Leader: Ms Vuyi Thabethe (LEDET)	*Thursday* *Day 3 (05 December)* Programme Leader: Ms Sarah Alcock (WESSA)	*Friday* *Day 4 (06 December)* Programme Leader: Ms Raylene Nel (DENC)
Registration By GS PMU (1hr)	AIDS AWARENESS Programme By GS Pioneers (30min)	Reflections By Programme Leader (30min)	Reflections and Final Evaluation By Programme Leader (30min)
Welcome By Mr Donavan Fullard GS Programme Manager (15min)	Reflections By All (30min)	Being an ambassador for Biodiversity By Ms Chantal Kotze GreenMatter (30min)	The SANBI national botanical gardens – A gateway to biodiversity. By Mr Chris Willis Chief Director SANBI (45min)
DEA – understanding the sector By Ms Wadzi Mandivenyi DEA (30min)	The Botanical Society of SA By Mr Stephan Veldsman (15min)	Planning my future with occupation specialists: 1. Dr Chris Cupido – SANBI – Researcher, taxonomist, acting curator 2. Ms Chantal Kotze – GreenMatter – Marketing and communications 3. Mr Phakamani Xaba – SANBI – Horticulture, conservation researcher 4. Ms Mandisa Kondlo – SANBI – Horticulture, outreach programmes 5. Ms Heather Terrapon – SANBI – Biodiversity information management 6. Mr Lemson Betha – WESSA – Environmental Education 7. Mr Johan Kruger – LEDET – Biodiversity, Climate change, research, Environmental Management 8. Dr Mark Graham – GroundTruth – Water, wetlands and environmental engineering (1hr 30min)	Health and Wellness By GEMS Security vetting By MIE (1hr 15min)
SANBI – An overview By Dr Tanya Abrahamse SANBI-CEO (45min)	Personal Branding By Mr Karl Smith (Business Networking SA) (1hr 15min)		
The Groen Sebenza Programme By Ms Vivian Malema Programme Director (30min)			
TEA (30min)	(30min)	(30min)	(30min)
Sharing of our journey within GS thus far – Pioneers' perspectives By incubants: Mr Mpendula Gabayi and Ms Naomi Mdayi (1hr)	Networking By Mr Karl Smith (Business Networking SA) (1hr 30min)	Planning my future By Occupation specialists (1hr 30min)	Health and Wellness By GEMS Security vetting By MIE (1hr 30min)
A Partner perspective By Dr T. Burger WESSA CEO (30min)			Final Evaluation and Farewell (Team photograph) By Programme Leader (15min)
LUNCH (1hr)	(1hr)	(1hr)	(1hr)
What does it mean to be an effective employee? By GS PMU (2hrs)	Financial Wellness – The Big 5 of money management By OLD MUTUAL (2hrs)	Planning my future By Occupation specialists (1hr 30min) Financial Literacy By GS PMU (1hr)	Departure
Evaluation By Programme Leader (30min)	Evaluation By Programme Leader (30min)	Evaluation By Programme Leader (30min)	
SUPPER		DINNER AND PARTY	

4.2.3.2. Initial skills needs identification by GIS incubants

Every day of the induction training, incubants were given tasks to perform. There was an instance where incubants were grouped according to the type of jobs they undertook at their respective workplaces, for instance GIS incubants were gathered in one place where the GIS expert, Heather Terrapon, facilitated the session. The group I joined consisted of the incubants who varied in areas of expertise but used GIS as a tool, for example there were incubants from the biosecurity field and GIS specialists.

The role of the facilitator was to provide the incubants with guidance and show them the qualities (work/occupational specific skills) required in the field, the trends of GIS industry and opportunities/labour market of the GIS profession. After this session the incubants were given a questionnaire to fill in which focused on the initial skills needs identification (refer to section 4.2.3.1.).

This form consisted of four parts; occupational specific skills, generic critical skills, life skills[16] questionnaire, and workplace skills needs identification.

The incubants were required to make lists of the GIS occupational specific skills (part 1) and generic critical skills (part 2), and to rate their competences, starting from "I cannot yet do this", "I can do this partially and am unsure how competent I am", "I can do this" and "I need training to be competent".

Part (3) of the questionnaire on life skills focused on the incubants ticking an adverb which described them or their actions most accurately. The options of adverbs were "never", "sometimes", "always" and "I'm unsure what this means".

[16] Note the category of technical skills, and generic and life skills, are in accordance with the GS project terms.
Keynote speakers chosen were of good reputation in their field.
Also note that the GIS incubants chosen for this study were those with academic qualifications ranging from a BSc degree to an MSc Degree.

Section (part 4) required the incubants to reflect on what they had been doing and gaining in their workplaces and what their needs were in relation to the list of skills provided by the expert.

Based on the initial needs identification form detailing the above mentioned content, I firstly present the analysed data drawn from the June 2013 induction training. In this group six GIS incubants with a BSc Degree /BSc Honours Degree attended (amongst the other GIS incubants who had lower qualifications). There were two incubants who held a BSc Honours and four with BSc degrees. One incubant was from SANBI [and was a participant in this study] and the rest from DEA, and only two from DEA were placed in ESRI [who were also the participants in this study]. However a questionnaire of one of the participants who also attended this induction training went missing.

- In general, the incubants were confused about what skills belonged to what occupational or generic skills. 3/6 put what is considered "generic" in both part (1) and part (2). However if we combine the generic skills together, the key ones which they felt they needed training on because they either cannot do or can partially do were:-
  Communication skills, computer skills, report writing, and presentation skills were most frequently mentioned; and paying attention to details. Time management, networking, project management, and desire to learn were mentioned the least.

  When I isolated the GIS incubant participants in the study from the rest, the generic skills they identified and which were frequently mentioned were communication skills, presentation and networking skills.

- For occupational specific skills, all of the six GIS incubants stated that they felt they needed training on the use of GIS software and GPS, Microsoft Access/excel and metadata/database organization and management. Geo-referencing and GIS business entrepreneurial were the less frequent skills mentioned. Some of the skills mentioned were part of the specific GIS software package that each individual uses at their organizations.

- Life skills questionnaire (part 3) (refer to graph 2) consisted of questions pertaining to teamwork, articulation, planning and organizing, prioritizing (time management), acknowledging social diversity, conflict management (problem solving) and listening skills.

  What stood out the most was that the incubants struggled to articulate fluently with colleagues (5/6), and prioritizing (4/6). Only one found it hard to work with a diversity of people, and one struggles with planning skills. Otherwise in other aspects, they always found it easy to do.

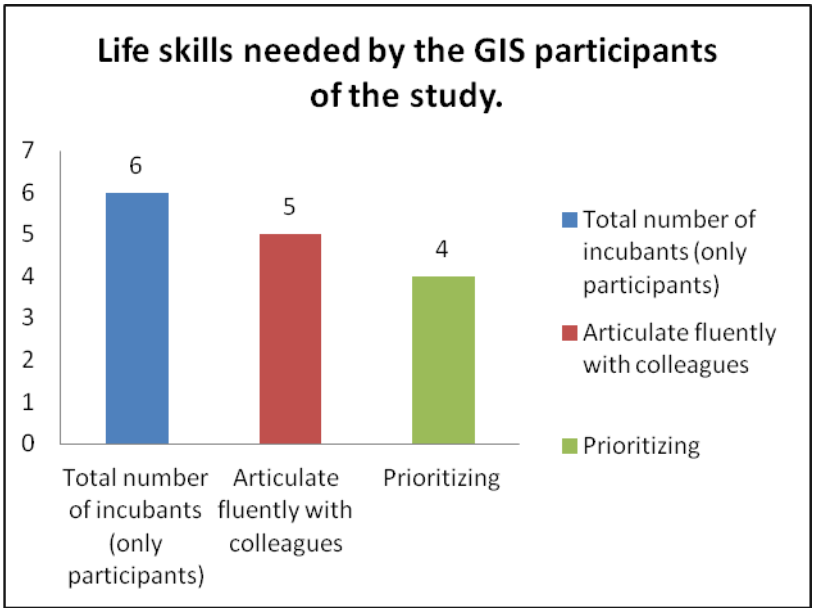
- Part (4) is where incubants reflect on what they have been doing at their workplaces, sharing their experiences, what they have learnt and what they would like to see happening in the future.

  All incubants from the DEA shared that they were inducted into their workplaces and into the DEA partnering organizations (e.g. CSIR, DBSA). Not only that but they were able to see how the networks related to each other. Through that they were able to identify opportunities. They were also given duties to do research about those organizations and as a result each individual has gained something meaningful, for instance one mentioned that he was able to make informed decisions about his career path, the other said she "gained life skills". And because their appointments at DEA have to do with being skilled in entrepreneurship, one mentioned that he was starting to refine his business idea, and others saw a need to study further, and one wants to become an informed, reputable and well-connected business person. The incubant from SANBI mentioned that he managed to complete his project, establish networks and receive training prior the induction training.

Following is the presentation of the results from the December 2013 induction training. The format of the document, the initial skills needs identification questionnaire, was designed identically to the one used in the June 2013 induction training. This was the induction

training I managed to attend. My role was to be a researcher and coordinator of some aspects of the programme, e.g. rendering the programme evaluation sessions (which I present in the following sections). There were eleven (11) GIS incubants consisting of six who had acquired a BSc Degree, four with BSc Honours and one with an MSc. The incubants came from various institutions which included LEDET (2), DEA/NRM (2), Cape Nature (4), DETEA - Free State (2), and DEA (Working for Water)[17].

At this induction training the participants in this study were from LEDET, one with an Honours degree and the other with a BSc degree.

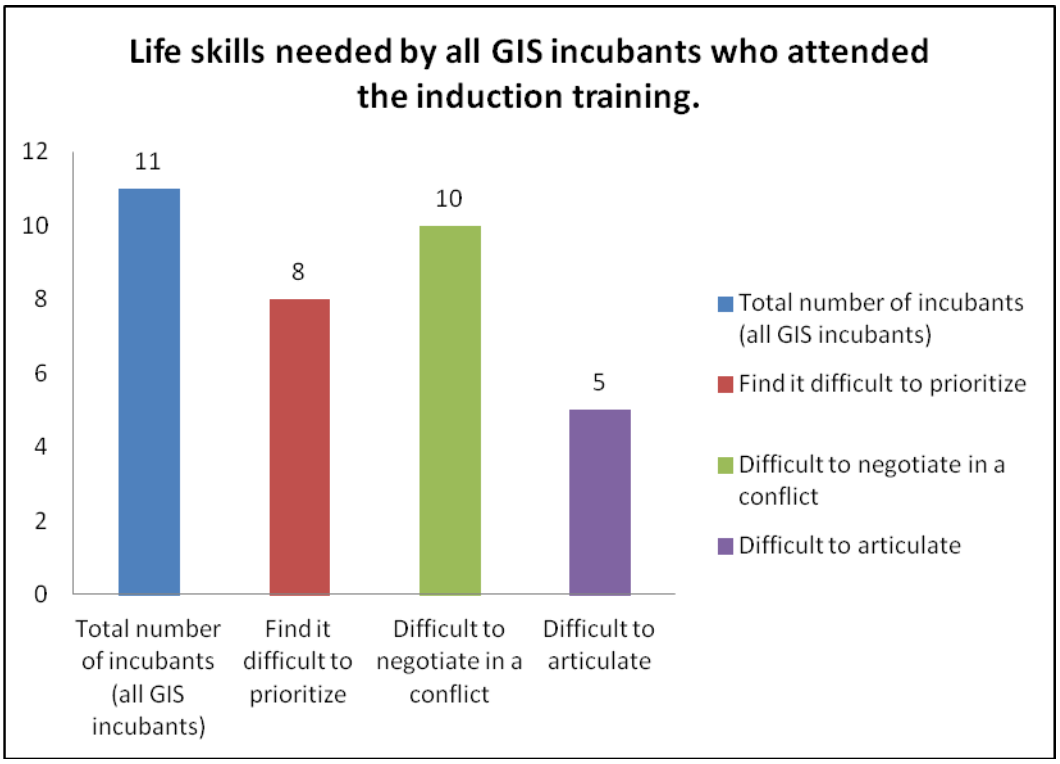


Graph 2: The graph shows the GIS incubants participants in the study (i.e. six incubants) who attended the National Induction training. Each identified the life skills they needed prior to the training at their workplaces and some had already started at their workplaces. The life skills needed the most by the participants was to 'articulate fluently with colleagues' and prioritizing.

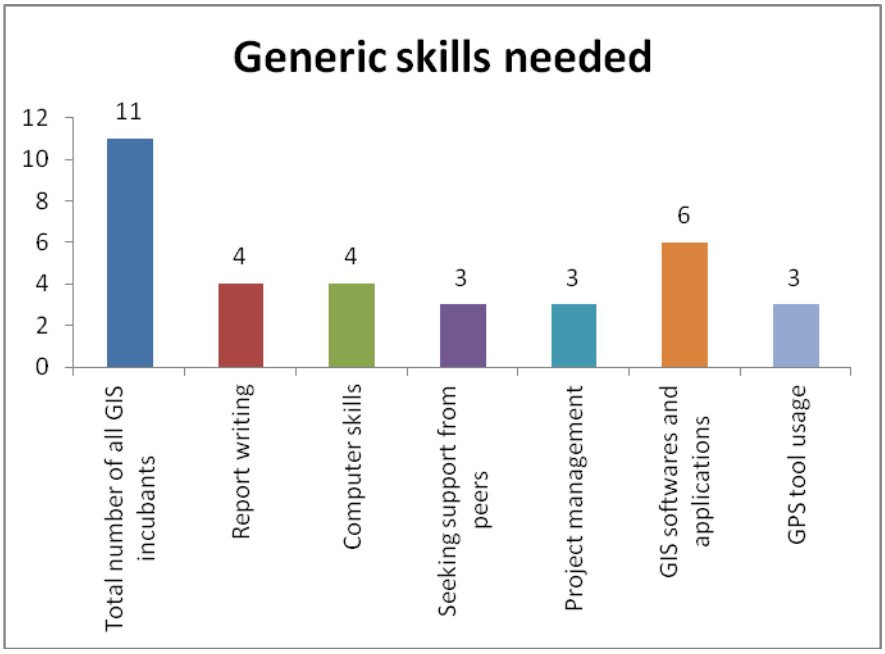
[17] LEDET: Limpopo Economic Development, Environment and Tourism

DEA/NRM: Department of Environmental Affairs: Natural Resource Management

DETEA: The Department of Economic Development, Tourism and Environmental Affairs



Graph 3: The graph shows the total number of GIS incubants with the minimum qualification of a BSc degres (i.e. 11 incubants – including the participants) who attended the National Induction Training. Each group identified the life skills they needed prior to the training at their workplaces and some had already started at their workplace. The life skills needed the most by the participants was to 'articulate fluently with colleagues' and prioritizing, and 10 of the GIS incubants mentioned that they found it difficult to negotiate in a conflict (i.e. situation).



Graph 4: This graph shows the total number of GIS incubants who attended the December National Induction Training (with the participants included) and 6/11 identified that they lacked the generic skills of knowing GIS software and its application

Graph 5: The graph shows the total number of University GIS incubants (December induction training) who needed occupational specific skills and most of them, 7/11 needed knowledge of spatial analysis.

- This group has mentioned that the generic skills (refer to graph 2) that they can do but are not sure about their competence are the following:
  4/11 mentioned report writing, 4/11 computer skills, 3/11 seeking support from peers, 2/11 project management.
  Even though they were not sure about their skills competence mentioned above some still felt that to improve in those areas they needed training.
  The skills acquired and the skills needed varied with individuals, some (5/11) felt confident about their computer skills, (3/11) report writing, and (2/11) listening skills.

  When I isolated the views of the GIS incubant participants in this study; Tumi said she needed support from peers, but she is confident about her computer skills. Calvin mentioned that he is not sure about his report writing and computer skills and would need training on project management.

- For occupational specific skills (refer to graph 3), 5/11 mentioned that they cannot do programming and script, and 3/11 cannot do database management.
  They will need training on spatial analysis (7/11), programming and script (6/11), database management (4/11), working with data (4/11), and cartography (3/11).
  This task of determining which occupational specific skills individuals would need was an exchange negotiation because 6/11 were confident about their skills in cartography, and 5/11 can work well with data.

  Both of the GIS participants involved in this study were confident about working with cartography; however one could work with data whereas the other could not. Furthermore both of them needed training on spatial analysis.

- In the life skills questionnaire, what stood out the most was that often they (8/11) found it difficult to prioritize, and that in conflict situations they

(10/11) would/could not negotiate their needs. Also 5/11 found it difficult to articulate. Otherwise in other aspects they can get by.
Other than wanting to do more training in advanced GIS related tools, software and applications (6/11), other (3/11) incubants felt they needed project management courses and 3/11 needed GPS tool usage.

From the study's GIS participants' point of view, they are both struggling to prioritize and would often fail to negotiate their needs should conflict arise. So far, most incubants were doing GIS related activities such as creating geodatabase and mapping. Additionally some were able to do tasks outside of the GIS scope such as conducting fieldwork for collecting data for other projects either with their mentors or other colleagues.

4.2.3.3. Analysis of the Evaluation forms – Initial skills needs identification

(Please note Lebo's evaluation form was not found)

Table 12: Initial skills needs identification of the incubants during the induction training (Both June and December 2013).

Symbols :-

Occupational specific skills : Groundtruthing = GT ; Georeferencing =GR ; Database management = DM ; Lidar Use = LU ; Programming = Pg; Spatial Analysis = SA ; Web skills = WS ; Arcview = AV ; Entrepreneurial skills = ES ; Microsoft access = MA; Remote sensing = RS

Generic critical skills : Presentation = Ps ; Communication = C ; Project management = PM ; Public Speaking = PuS ; Time management = TM

Life skills : Articulation = A ; Prioritizing = P ; Listening skills = LS ; Negotiation skills = N ; Networking = Net ; Advanced GIS = AGIS ; Study further = SF

Workplace skills : Knowledge about conservation planning = KACP ; Different method for collecting field data = DMCF ; Writing a business proposal = WBP

Name of incubants	**4 categories from questionnaire**											
	Occupational specific skills						**Generic critical skills**		**Life skills**			**Workplace skills**
MacD	Pg	G	G	M	D	LU	Ps	C	A	P	LS	

		R	T	A	M													
Tumi	Pg	RS		SA			PM				N		P			AGIS	KACP	
Calvin	DM	Pg		SA			PM				N		P			DMCF		
Tso	DM	WS		AV		S	PuS		PM		A			P		SF		
Lebo	n/a	n/a		n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
Mosidi	ES						Ps	PM	C	TM	Net		A	P	N	WBP		

Each incubant was given an evaluation form daily (refer to section 4.3.3.3.) to rate the sessions of the day from “unsatisfactory” to “excellent” in terms of the structure, stimulating engagement and relevancy to his/her needs. And the following morning the day would start with the reflections of the previous day. Also in some instances incubants gave a presentation to everyone on what they were doing at their workplace, their successes and challenges.

So each day I was given the task of examining about 250 evaluation forms and providing a summary of the insights. During the examination, I noticed that incubants had lots to say in the beginning of the training, but as the training proceeded, they were not writing much or sometimes repeated themselves even though the questions were different each day, moreover some of them did not submit their evaluation forms.

Nonetheless, I managed to summarise three parts of the evaluation form which included the following

- The incubant’s overall experience of the day,
- Suggestions for improvement,
- And any comments.

Table 13: The table showing analysed results of the daily evaluation forms. The only parts of the evaluation forms which were analysed were the incubant's overall experience of the day, suggestions for improvement, and any comments.

THE INCUBANTS' OVERALL EXPERIENCE OF THE NATIONAL INDUCTION TRAINING	
Understanding of GS and the sector	- There was also a mind-set shift where incubants started to see the bigger picture of their contribution to the whole sector. - Some mentioned that they now understand the Groen Sebenza history and project, and they know the incubants purpose in their workplace. - "I am grateful that SANBI brought people who care about us and share their expertise". - "I am happy that SANBI organizers are listening to us".
Career orientation and motivation	- They were also hopeful. - They were learning to have a positive attitude from learning from others' experiences. - Incubants were starting to align what they do to the career they would like to follow. - Mr Karl Smith, the motivational speaker, inspired many incubants and they felt he empowered them with necessary knowledge and skills in both personal and professional areas and they will implement what he has taught them. - The speakers renewed their passion and encouraged them to work hard and pursue their dreams.
Relevance of sessions and content	- Old Mutual was relevant and useful. - Some picked up the content in its finer details of what speakers has spoken about, for instance, how to control alien species. - One incubant said "I got what I wanted". - "I am content with today's information". - "It was educational". - They also felt that the HIV/AIDS drama was well played and presented the message well.

	- They mentioned that the questions that have been bothering them have been addressed.
Application to CoPs	- They are able to be reflexive on their behaviour at their workplace and would like to improve. - And they are going to implement the lessons learnt from the induction training into their workplace. - - I also observed different perspectives on how they deal with challenges.
General experience	- After other incubants shared their experiences, one incubant mentioned that "I have learned to be grateful with the little things I have because other incubants have bigger problems than I do". - Most recurring expressions were that they had 'great experience', 'fun'. The sessions were 'fruitful', 'productive', 'excellent', 'effective', 'inspirational', 'fantastic', 'tremendous', 'pleasant', 'interesting', 'mind-opening' and 'informative'. - They also mentioned that the accommodation they were allocated was "nice". - They do not regret attending the induction training. - They felt the speakers should have been brief and should have a sense of humour.
SUGGESTION FOR IMPROVEMENT	
Interaction and engagement	- Slides used by keynote speakers were not clear and visible. - Group sessions should contain smaller numbers of people. - Groen Sebenza should open social network account like twitter, Facebook, etc., so that they can share their experiences. - There is a need for time management for the speakers. - They want to learn more in their organizations. - Incubants mentioned that the keynote speakers should manage their time because if they take long they become 'drowsy'. - They would like to have more peer group engagements and activities. - The reflection time should be longer so that the facilitators (SANBI) could respond to their questions. - They needed more time for discussions and sharing of workplace experiences.

	- They wanted extramural activities like soccer, netball, rugby, etc. so that they can also have fun (outside of the serious business) - Keynote speakers such as the fellow incubants were inspirational and they do not have any regret joining GS. - Incubants speakers should be from different organizations.
Workplace queries for future inclusion	- SANBI/GS should visit their workplaces. - They wanted their quarterly reports to be submitted. - They need clarity on their operational budget because they need resources but do not know who to talk to. - They also mentioned that they want to know the 'line of communication' in their workplaces. - Some asked about a better way of communicating with mentors without offending them or negatively affecting their relationship.
General	- All sessions were relevant. - Many expressed their gratitude to the GS staff and were grateful to be part of the project. - The day sessions were not boring.
GS operational queries	- What does the GS budget mean to incubants as individuals? - They wanted clarity on who exactly is responsible for providing operational resources in their host organisations? SANBI/GS or the host organization? - Many enjoyed the task about "what does it mean to the effective employee" and said it was great. - Some suggested that SANBI/GS should provide them with uniforms.

4.2.3.4. Observations of the second National Induction Training, December 2013

Figure 21: The picture shows some of the incubants who attended the December National Induction training.

Figure 22: The picture shows where the National Induction Trainings took place, i.e. Birchwood Hotel. At the bottom left, the presenter was one of the incubants, Mpendulo Gabayi, who shared his experiences as the incubant at Kirstenbosch Gardens. Top-left is the presentation by Dr. Tanya Abrahamse who was explaining how the incubants fit into the whole project, Groen Sebenza.

Figure 23: These pictures show different occasions where incubants were engaging and building networks.

Figure 24: These pictures demonstrate different sessions where incubants were separated according to their area specialities and were taught about the trends and industries of their field GIS (i.e. top left and right and bottom left). Heather Terrapon (top-right) was a GIS expert invited to guide the incubants about the GIS field. Bottom right it was when the incubants from different fields were grouped to share about their experiences as incubants at their respective institutions.

The respondents' evaluation reviews will be discussed in more detail in Chapter 5 as this study does not want to generalise the experiences that is why it sought to analyse each incubant's experiences.

CHAPTER 5: INTERNS' EXPERIENCE OF TRAINING AND LEARNING, AND ITS CONTRIBUTION TO PREPARING FOR FULL PARTICIPATION IN CoP'S

5. Introduction

Here I present the themes that emerged from the interviews and workplace observations which focus on the interns' experiences of training and learning, and its contribution to preparing for full participation in CoPs.

Furthermore, this chapter is constructed in an abductive manner by aligning the data presentation with concepts drawn from the foundational theory of this study, Legitimate Peripheral Participation by Lave and Wenger (1991) with concepts from Amartya Sen's Capability Approach (1990). Also importantly the structure of the study is guided by the research question and sub-questions of the study, and the approach I used to discuss and analyse data (refer to Chapter 3). The chapter is also structured in an inductive manner because I allowed the findings to yield new themes. I also organized the data in a sequence of how the activities of the research study took place in order to make sense of them but there were instances where other activities overlapped. For instance the interviews were conducted when some of the GIS incubants had attended the National Induction Training and others had not.

5.1. Motivation and Expectations

I used the theory of expectancy by Lunenburg (2011) to explain the organizations' and incubants' motivation and expectations from each other and from the GS project. Lunenburg (2011) stated that this theory is a cognitive process of theory of motivation which is based on the assumption that people believe that there is a relationship between the efforts made, performance achieved, and the rewards received, in order for them to stay motivated and react in whatever projects they want to pursue in life. Thus every individual will join the organization based on what their needs, motivations and past

experiences are. Similarly with the organizations, they would want to adopt the GS project based on those assumptions. But for the assumptions to take form there needs to be three key elements which are expectancy (effort will lead to acceptable performance), instrumentality (performance will be rewarded), and valence (the value of the rewards is highly positive) (Lunenburg, 2011). This was the lens I used to examine this theme.

5.1.1. Motivation of why the organizations applied for the Groen Sebenza internship project

To understand the institutional motivation for applying for the GS programme, it was helpful to have insight into the intentions of the GS internship project. The interview conducted with SANBI CEO, Dr Tanya Abrahamse, who formed part of the pioneers of the project took us through the reasons for its establishment. She said that the intentions for establishing the Groen Sebenza project were:

> "firstly … we knew that the impact of apartheid education meant that many young black people or former disadvantaged young people still had the impact of the old education system … so we were finding … we couldn't find scientists from the historically disadvantaged population … and we struggled as the institution to employ people with … to overcome the skewed nature of biodiversity and conservation sectors … we knew we were not finding young people with those qualifications … the other reason is because our country is facing a huge unemployment … the third reason was that we were convinced that the biodiversity sector (conservation) and the green economy had huge opportunity for jobs … so we wanted to kick start that" (line 4-14, p. 1).

In sum the reasons were to create jobs for young people, to address the lack of qualified professionals from disadvantages groups, and thirdly they knew the green economy had huge opportunity for job creation.

The reasons for institutions to apply for this internship project included various motivations which did not necessarily correlate directly with those of the GS:

> Skill development [but] with added benefits … our understanding is that we have an obligation, that is we have to give the interns work experience … so how do we do that? It does not matter … we are a private company … we do not get funding from government … all organizations should have the bottom line … the bottom line for us [as a private organization] is to make money … there is no other reason for business to exist ... in general we need to produce and respond to our crying economy … and they all, [including] the interns contribute, it does not matter at what level (Sofia 1, ESRI).

However for the most part the organizations involved were responding to the need of the institutions for filling vacant positions and at the same time they were responding to how institutions themselves can participate and contribute to alleviating the lack of qualified personnel from historically disadvantaged groups. These included a motivation for building capacity for employment in the biodiversity sector, as well addressing staff shortages due to the fact that there was a high level of staff turnover, and consequently also staff shortages. This was supported by Thoko, the Freshwater Biodiversity Planner (or GIS) and mentor from SANBI who said:

> it is mainly really to try to build capacity … we are hoping to see a GS candidate graduating into a formal (way) of being in a workplace under SANBI, and working as SANBI permanent employee or even if it's not SANBI but in the biodiversity sector (Thoko 1).

Kevin, the acting manager in the Directorate of Biodiversity Planning and Management explaining LEDET's motivation for joining the GS project:

> I will start speaking about our directorate, biodiversity directorate, which is the scientific services of this department…we have had problems for many years with staff leaving the department…we are supposed to be 27 people but we are 5 staff members, 3 scientists and 2 technicians…that's it (Kevin 1).

Although Kevin felt that the filling of the vacancies was a good idea, he argued that the manner in which the department approached it was not appropriate which created a lot of misunderstandings with the GS project (Kevin 1). He further said that some people in the department thought that GS was an easy way to fill the vacant positions that exist within the department but as reported in section 6.5.1 the shortcoming of these perceptions was that they did not know that the GS incubants would need mentors which they did not have.

5.1.2. The incubants' motivations to apply for Groen Sebenza

While institutional intentions and motivations were as described above (Theme 1a), the interns had their own motivations. Because they are vulnerable to the distresses (mentioned above by SANBI CEO, Tanya Abrahamse) especially unemployment, all of them were involved in this project because they wanted to work or have a job. They did not only want to *just* work but wanted to do work related to what they studied at University. However some of them are into the GIS occupation not by choice but by circumstances that of course relate to issues of unemployment in other fields. I say not by choice because they had put their heart into other occupations, for instance, Tumi and Tso really wanted to be geologists. Even though they studied GIS related courses at University which was incorporated in their curriculum, it was not really their priority to work in the GIS field. So they initially applied for the GIS vacancy 'just to take a risk'. This was supported by Tumi when she said:

> I studied two majors geography and geology ... so I didn't find a job in geology sector … and all this time I was unemployed … when I saw the post I was like, let me try this GIS thing … obviously I didn't have much experience in the environmental sector per se … what we did [in environmental studies] was basically modelling … basic background of conservation … but I was like this is something I can do … and [besides] GIS and environmental sector is one of the interesting things [to pursue a career into] … Ok I was like let me try it and see how things will go (Tumi 1).

Similar to Tumi, Tso said:

> I studied geology and majored in environmental [studies]… with UKZN … so I was unemployed for about 9 months and at that point I was not keen to go to the mining industry because of all this strikes and chaos … so I really got interested in getting into environmental sector … then I saw the advert of GS and they wanted someone with environment background … I did environment sciences and GIS and I thought let me try (Tso 1).

Tso's decision in taking up the GIS vacancy was affected by current political developments in the mining sector in South Africa for example the Marikana massacre[18]. As a result she was afraid to work in the mining sector.

Tumi's and Tso's cases were different from MacD's and Calvin's. MacD and Calvin had a similar background of having been involved in internship programmes prior to the GS internship, and also having studied GIS to the Honours degree level. However their motivations for applying for GS internships varied, firstly f MacD, after having finished the NRF one-year internship he was frustrated because he could not find a job and he said:

> [I] have something to do [now] rather than staying at home doing nothing … applying for jobs … getting stressed … so GS came to the rescue (MacD 1).

On the other hand Calvin's motivations were to improve his years of working experience so that he could become marketable, to gain more working experience in the GIS field so that he could qualify to apply for a GIS recognition certificate. Even though he was an intern as a GIS technician he was not working in the field he was familiar with, which was spatial planning, but he was keen to continue in environmental management. When he saw the vacancy advertisement stipulating that the GIS officer would be working in that field he was interested in applying (Calvin 1).

[18] Marikana massacre or Lonmin strike – August the 16th, 2012 is known as a day of tragedy in the North West province (Rustenburg) of South Africa where 34 mineworkers were killed and about 70 wounded by policemen during a protest.

5.1.3. Incubants' expectations from the Groen Sebenza internship project

As much as the GS Internship project had its own expectations which are mentioned in the GS Internship project's documents and by Dr Abrahamse (see section 5.2.1), incubants too had their own, which include:

> to get training, get to know other people, networking, gain more experience … and to get a permanent job at the end (MacD 1), and
>
> to get more knowledge in that field and practical work (Tumi 1), but not just any practical work or experience but the one that you attain through training in a workplace (Tumi 2).

Tumi felt it was very important to acquire workplace experience because she was fresh from University (Tumi 1) and had no work experience which put her at a disadvantage when entering the job market since most employers require 2-3/3-4 years of work experience (Tumi 2). She hoped that GS would give her this. She further emphasised a point about the work experience:

> The main thing these days is for one to get [good and relevant] working experience, and if you don't have [that] experience you can't get a job, and if you can't get a job then it's a waste of all the years of studying (Tumi 2).

Similarly to MacD and Tumi's expectations even though theirs are more general (yet important), Calvin's expectations are more about the specificities required for the conditions that will enable him to be productive in the workplace. He said:

> I expected a lot where I work in a team with a suitable mentor who specialise in GIS and … have enough resources to carry out my duties ... I expected to acquire as much knowledge as I can so I can be marketable ... so that I can be able to register with PLATO (Calvin 1).

He shared the same sentiment about registering with PLATO as MacD since being a registered and recognised GIS officer was very important in the GIS field and if you were not then:

> it will be very difficult to grow in the field of GIS … Also the government agencies [when you apply for GIS jobs] they want you to have been registered (Calvin 1).

It was important for him to have a mentor who specialises in GIS because that was one of the prerequisites of registering with PLATO.

Tso's expectations were more diverse than just acquiring GIS skills and knowledge and competencies because her engagement with GIS was to understand the 'ins and outs' of GIS, from programming, developing and application, because she needed to add the aspect of business into them, which implied that she needed to know how to establish a GIS business using the skills and knowledge that she acquired from her workplace. This was supported by her when she said:

> My expectations are to learn more about GIS … knowing how to run the software/program without looking in the manual … but from DEA point of view we have to balance GIS and business (Tso 1).

5.1.4. Mentors' expectations (anticipations) from the Groen Sebenza internship project and training

It was also important to understand the mentors' expectations because, to some extent they acted as brokers between the GS Internship project and training, and the institution, and between the institution and the incubants, and between the incubants and the world outside of their institutions. In the first six months of the GS project, one mentor was looking forward to:

> capacitate him [the incubant]… give him more training, expose him in opportunities that arise, just grow his professional capabilities, giving him opportunity to network, present at conferences (Thoko 1).

Her hopes for this incubant were:

> to really see him prosper … being the best of what he can …being good as a GIS technician … being able to adapt to any kind of GIS project not specifically what we

> are doing here ... if he wants to work for a mining industry it's fine as long as he can know the standard, rules and legislation around GIS work … being able to produce GIS project without data errors and loopholes (Thoko 1).

This data showed that Thoko could be referred to as a mentor who was focused more on technical skills and competencies. It was possible for her to focus on these elements because she had worked with her incubant (i.e. MacD) previously in the DST-NRF internship programme, and the GS project provided a continuation or the possibility for improvement on what was lacking or unresolved from the previous internship programme.

Treve on the other hand, aimed at capacitating/leading his incubants more in an academic direction. Treve said:

> however I think the successes is the fact that we got Tumi focusing onto taking her career further … rather than just sitting … and a lot of interns don't have any interest in studying further … I know so because one of my intern doesn't want to … (because his justification) is that he is not aiming high because he is now arrived ... Tumi she is grabbing options … and it looks like Calvin will do the same … I'm very aware of kind of pushing people to do the kind of stuff I want to do [want to do] especially when going to higher degrees and halfway through the thesis they end up bored, or they are just not interested or whatever (Treve 1).

His career background has been in research; also his area of expertise and his working environment [which was specialised] encouraged academic pursuits. Nevertheless he was:

> Push[ing] and try[ing] to make one of his incubants [Tumi] indispensable … so that by the end of 2.5 years if she leaves [the institution] that she leaves such a gap, a hole that they [the institution] can't contemplate it (Treve 1).

Though Treve was a mentor of two GS incubants, here he was only referring to Tumi because he spent most of the time in the first semester of the GS project with her. Calvin joined his team later toward the end of the first semester, and because of that he talked more about Tumi's abilities, her likes and dislikes, etc., and he could not really say much about Calvin as he said:

> and Calvin just joined us now (a month ago) and I can't give him much in terms of documentation and stuff" (Treve 1); … and with Calvin … we are still at the stage where I have given him opportunity to think about it … I don't want to drive him into something he doesn't want to do … and I will guide him where he wants to go (Treve

> 1); also Calvin is very quiet sometimes and it's difficult to reach out to him sometimes … and he doesn't open up … but Tumi is very efficient and focused and talks quickly, you will know where she stands all the time (Treve 1).

This data demonstrated that understanding the incubants professional and personal characters and pursuits, time spent (or history) with incubants, and the personal preferences and career background of mentors, plays an important role in the building of expectations (also in the planning of the program) of how mentors can mediate and support the development of incubants.

5.2. EXPERIENCE OF PHASE 1: TRAINING AND INDUCTION

5.2.1. *The incubants' experience of the first phase of the gs internship project, The National Induction Training*

In Chapter 4 I presented data showing the experiences as expressed by 50% (about 300) of the GS incubants who attended the second National Induction Training in December 2013. Here the focus is only about the experiences of the GIS GS incubants who were involved as they are the focus of this study. The GIS incubants interviewed had different opinions about how the National Induction Training was organised and executed, and how it had benefitted them as individuals, both personally and professionally. However they all shared similar views about the activity where the incubants were assembled according to the occupations they assumed and were led by a GIS expert to guide them on the baseline skills needed in the GIS field (refer to table 2). They found that activity very useful especially as they needed to reflect on the duties they performed at their workplace and needed to identify the tasks that were supported by those skills. This was supported by Tso when she said:

> There were sessions where we were grouped in different occupations … where GIS were isolated from the rest, and we will have a session with an expert who will tell us which skills are upcoming in the market, where we can get opportunities … and what skills to learn in order to succeed in the sector … yeah it was informative (Tso 1).

And MacD said:

> It was well organised … the speakers and motivational speakers were very professional … and they actually taught us a lot … for example firstly networking, how to deliver at work, we were involved in many activities where people were grouped according to the areas of speciality … and we were able to identify the training needs we require to be better in our fields … sharing info within ourselves as incubants (MacD 1).

Tumi said:

> I enjoyed most of the talks and presentations …a nd the one that I enjoyed the most was the part when we were divided into groups according to the occupations we assume … I learnt a lot ... just about the different skills that I needed … at times we don't even know it we just think anything is a suitable skill but we don't think deeper if those skills are relevant for our careers (Tumi 2).

They learnt that not all skills imparted by a workplace were necessary for GIS occupations, this was also emphasised by Tumi when she said:

> I learnt a lot … just about the different skills that I needed … at times we don't even know it … we just think anything is a suitable skill but we don't think deeper if those skills are relevant for our careers … that was really eye opening and increased my knowledge in terms of GIS and to know which skills are of importance (Tumi 2).

Thus amongst the list of technical, generic and soft skills and knowledge presented to them by the GIS expert (see table 2 in Chapter 2), the skill identity activity required them to do the following:

- they needed to reflect on the tasks they were doing at their workplaces,
- they needed to be able to identify the relevant skills needed in the careers they wanted to pursue with reference to the list of skills provided,
- after that they needed to see if the skills they want to acquire or were required for their career are incorporated in the tasks they do at their workplaces,
- and if these skills did appear in their tasks then they needed to nurture them or strengthen them, but if not, they needed to discuss their career plans with their mentors.

Besides the activity led by the GIS expert, there were other diverse activities and presentations happening and each GIS incubant mentioned those that were profound to

them for instance, 2/6 mentioned how they learnt the skill of networking, 5/6 incubants were inspired by the motivational guest speakers, 3/6 gained a better understanding of how each incubant fits into the bigger picture of the biodiversity sector, others 3/6 got to meet other incubants from different institutions and learn what they were doing, and the other admired the lodging facilities they were placed at (Tso 1, line 102, p. 4) and found it professional. Even though Calvin might have shared similar experiences and found the Induction Training useful, he still felt that:

> but you know when we were there at the induction Training we felt like there will be many changes when we return back to our workplaces … But when we actually came back it feels like all efforts were all for nothing (Calvin 2) there were lots of issues raised by incubants at that induction training and SANBI assured us that they will sort them out … and right now it's been how many months now? We are going to the 6th month and then you ask yourself if they really meant what they pledged … Not much has been done … there was a lot of talking in that induction and we have not seen any action (Calvin 2).

In this aspect, he shared the same feeling as Kevin, the LEDET acting manager, that many things were discussed and nothing much has been actualised or materialised. Things have been slow in becoming tangible as he said.

5.2.2. Incubants' Roles And Responsibilities

The experience of the National Induction Training was a fitting foundation for this section and what was especially relevant was their interaction with the GIS expert who was invited to guide the GIS incubants about the baseline skills and knowledge and competencies which were marketable in the GIS field. I refer to those skills and knowledge and competencies to comment on incubants' roles and responsibilities. It was also important here to describe their experience over time (and treat them separately), to see how their tasks have changed over time because the theory of CoP argues that as peripheral participants get into the core of the CoP they are usually given simple tasks in the beginning and over time they become involved in more complex tasks, roles or bigger responsibilities.

In the first six months of the GS project MacD was creating maps, helping peers with database organization and management, he was participating in the main projects of the

department (e.g. wetland inventory) and writing reports. His mentor's views about his tasks confirmed this (Thoko 1) which meant that he was on track and knew what he was doing. During the second semester of the project he said that:

> Roles and responsibilities have not changed that much … but only that the workload has increased because we are chasing for the deadlines … so we have to thrust by all means and work with a higher pace than before (MacD 2).

Tumi's first semester focused on organizing geodatabase or managing the database, creating maps and assisting peers with the database. And she (like Calvin) also participated in one of the main projects of the department which was filtering data for the conservation planning framework. Similarly to MacD, in her second semester she said that "nothing was added":

> Besides that she gave GIS support to colleagues but it was not a regular thing as she added right now it is to help whoever needs GIS assistance … I do help but it's not an everyday thing (Tumi 1).

> Also I think from the last time it hasn't been that much ... because we haven't really done fieldwork, we haven't attended any training, we haven't … like most of the time we are just here ... the only thing that keeps me busy is the free online course (i.e. Quantum GIS[19]) … other than that not much has changed (Tumi 2).

As for Calvin he felt he was not as busy as Tumi in the first and second semester, firstly he did not like the open source courses even though he was supposed to do them together with Tumi, he felt that his responsibilities were:

> supposed to be just doing GIS stuff … collecting information … making sure GIS … to render GIS support, like assisting the ecologists with reviewing their EIA … maybe to check what is there … and I give them that spatial information … in the areas they want to make development … this is what I'm supposed to be doing … I do sometimes but not most of the time (Calvin 1).

[19] Quantum GIS – It is a free and open source GIS application

The only function Calvin felt he was fulfilling in the second semester was giving GIS support to his colleagues.

Both Calvin and Tumi seemed to reflect the roles and responsibilities in their GIS department at LEDET in the first semester as reported by their mentor (Treve 1).

Tso's roles and responsibilities, in her first semester of the GS project, was to create maps, give GIS support to peers, and publish maps for public use. This had not changed in the second semester and she felt that:

> I mean after a while you get tired of it … it does get quite … as a person you need work that is going to challenge you … so when you do the same thing over and over again you just … you kind of [kind of] lose interest somewhere along the way (Tso 2).

Lebo, in her first semester, at DEA was:

> Attending business courses … New Venture Creation course … they [DEA] want us to learn GIS in workplaces and acquire [work] experience … also they want us to apply what is learnt from the courses into our businesses ... they want us to have enough knowledge [skills and competencies] to be able to start a business at the end of the GS project for example GIS consultant company … they want us to at least have something to do even when we don't get hired for permanent jobs (Lebo 1).

At ESRI she was learning:

> Since I didn't study any of the GIS stuff at the University …s o they [ESRI] wanted to start me with the basics things … for instance editing data, creating table joints from the data … yeah that is basically all the basics for now … I haven't started with the real work as yet (Lebo 1).

As for Mosidi, she attended the same business courses and workshops as Lebo however at ESRI, since she had a better GIS background than Lebo and Tso, she performed different duties from them, in that she was:

> Training students [from other institutions]… and it's a good thing because when you train you get to be better in knowing the GIS tools … you will need to excel in your work

> because you need to know it before you teach your students … being a trainer also helped me with presentation skills, teaching skills, how to stand in front of people … I'm not scared anymore (Mosidi 1).

Here we see how a GIS education background shaped the way each incubant was assigned roles and responsibilities in their workplace. But not only that, even the workplace environment played a role in ensuring that they were equipped with relevant skills, knowledge and competencies. Also importantly they mentioned that their mentors also helped a great deal. Even though all incubants were performing GIS related duties, Mosidi and MacD seemed to be have the advantage of performing their roles better because they possessed all three features mentioned above.

5.3. INTERACTIONS

5.3.1. Incubants interactions with their mentors

It is through interaction with people that learning takes form (a theme throughout Wenger's work) but not all people in those interactions have the intention to learn. And these interactions happen in different conditions that will either promote or discourage learning. Complementary to that, it is not about positive interactions (e.g. agreement) producing positive learning or negative interactions (e.g. tensions) producing negative learning (Wenger, 1998a). The data has identified that the efforts of interaction especially at the periphery of the participation in CoPs are influenced by three conditions which demonstrate how, consciously or not, the manifestation of power relations could have an influence. The first one being *urgency of the minority* [being the incubant]. That is the incubant always being the one wanting to learn from mentors. Tso said:

> So people come to us [department] with data that need to be processed … and when they do I will ask to volunteer [in their projects] … also my supervisor knows that I like working on imagery (Tso 1);

Then the *hierarchical domain* (e.g. mentors interact with the incubants only if they want to give guidance/direction/authority for instance Treve said:

> Usually I would go down to their [incubants] office and discuss the way forward (Treve 1). Another example is when Thoko said: And I don't work like that, I tell you [the incubant] once ... unless you don't really understand certain things like administration stuff ... there I can help you (Thoko 1).

And lastly the *organizational structure* e.g. Treve said:

> At the moment because we have structural time ... but it's not ideal … usually I would go down to their office and discuss the way forward … as I said I have 3 interns, and 2 who are focused on GIS … I kind of have given them a little bit of space which obviously it's not hands-on supervision as much (Treve 1).

So here Treve was limited by time and had many incubants (3) to mentor which made it justifiable that he could only use his time to give commands rather than discuss or find new ways of dealing with the situation at hand; and last but not least it was *how all these three conditions interplay*. Whether these conditions will ever change positions or not will be discussed in Chapter 6.

Other than those conditions, the data outlined below shows that all incubants have good relations with their mentors and all of them mentioned that their mentors encouraged them to explore other activities happening outside of their scope in order to have a range of perspectives.

There were many ways in which the mentors and incubants communicated. For instance MacD described his mentor as someone who would sit down with him when they had work pressure to strategize how they were going to distribute the work in order to:

> Avoid to step on each other's toes (MacD 1).

Usually the meetings included briefing and progress updates and were set up in a way that was informal and most often was one-on-one verbal conversations/discussions (MacD 2). His mentor allowed him not only to talk about professional work but also his personal life (MacD 1) and that led him to regard their relationship as good. Additionally he said that

over time his mentor gradually trusted him with his work which has led to him to having the freedom to work alone and having confidence in his tasks. On the other hand Tumi and Calvin's relation with Treve, their mentor, was only about professional work and discussing ideas of how to tackle GIS problems. Their conversations were mostly about GIS work. They had meetings with him in his office whenever they wanted to as well as whenever he wanted to see them he would come down to their office. Often they sent to each other e-mails especially when he was not around. Though Tso's relation with her mentor was also about professional work, her mentor was authoritative because:

> She shows us what we need to do … she gets us new projects … and she tells us what we need to do and how we have to do it (Tso 2).

And because she was authoritative she was patient and was able to repeat instructions until they got them right. Because of that Tso considered her mentor:

> Very very nice and helpful (Tso 1).

This communication might have been different but they were working for the incubants especially for them to get by in their workplace. Whether they enabled or constrained them to prepare to participate fully will be determined or discussed in Chapter 5.

Last but not least the data has shown that there have been some misunderstandings and mistakes about how the incubant was performing, but the incubant and mentor managed to rectify them in time (Thoko 2). This also showed that the interactions in CoP were not always smooth and given time there will be the opportunity for making corrections.

5.3.2. Incubants' interactions with peers and colleagues outside of COP

In the CoP newcomers do not only learn from their mentors but they also learn from their peers and people outside of the community of practice (Wenger, 1991). These interactions do not occur in isolation but they are intermingled. Most of the time they did not learn about the content of the each other's job, rather they advised each other about how they

could do their job better. Also their platform of communicating was informal for instance MacD said he communicated with his peers on:

> Social networks ... in LinkedIn, Facebook, Twitter, and WhatsApp or

Because in every organization the incubants shared the same office they had time to chat to each other. They discussed how they were treated as incubants by the employees of the institutions and they motivated each other. In the institutions with many interns, they formed the 'union actions', they enquired about each other's work so they could see where they could assist, they did things together which included applying for training courses together, and because of these activities their relationship became stronger and they regarded themselves as a "big family" (Tumi 1). They also felt they had much influence in voicing out their grievances because they were many and could "get along". Even so they understood the limits of when to chat and what to chat about, as MacD said

> We know when to do the actual work and when to socialise or do the chit-chats (MacD 2).

The way the incubants interacted with other colleagues depended on their personality/attitude and urgency especially in the beginning and this was supported by Calvin when he said

> I think everyone is ok with me … I don't talk a lot … and regarding my work, I don't know because I don't really know what they do (and vice versa) because we all have our own supervisors (Calvin 1).

Tso said that:

> And as for my colleagues ... we are not really used to them (Tso 1) and because we are based in our office with our mentor and our mentor is great … and we don't care about what happens outside the office (Tso 2).

Tumi also said that:

> and the other lady who is not even in our department has also been encouraging me … just pushing me to do better and not just to lay back and feel sorry for myself … at

> times you need to stand up and make things happen for yourself … she has been good just being there (her presence) being supportive (it makes a difference) … and telling me what I need to hear (Tumi 1).

5.4. EXPERIENCE OF PHASE 2: TRAINING AND LEARNING IN WORKPLACES (INCLUDING REFLEXIVE EVALUATION)

5.4.1. Experiences of the second phase of the Groen Sebenza internship project: attendance at national, regional or institutional training courses

At the time of data collection (i.e. within 12 months) the incubants had attended neither National nor Regional training courses offered by GS, but they had attended the institutional training courses. There were benefits and challenges experienced regarding those training sessions. Each person had different opinions about the course training they attended. For instance MacD did not receive any institutional training in the first semester, however he managed to attend one in the second semester where he received a completion certificate with ESRI which was accredited by SAQA for GIS.

Tumi and Calvin went for an R-statistics course which they found interesting and felt it had the potential for being useful in their work activities yet they could not make a link. They would have preferred to have gone on a course that was more focused on GIS. Regarding GIS training courses it:

> Has been a huge struggle because we have been told that there is no GS money … and without that money nothing can happen (Tumi 2).

On the other hand Tso attended many training courses from the beginning of her term which included:

> basic GIS, standard GIS, advanced, remote sensing … the server courses, sites configuration, sharing GIS content on the web, but when it comes to the everyday

> work we are still doing pretty much what we have been doing just the basic stuff although we have the advanced training we still do the basic work (Tso 2).

She also felt that:

> because I received a lot of training … I feel like all that training will go to waste.because the work that I do now is what I have learnt in the basic course … so I feel like what was the point of me going to do the advanced course if I am only going to do the basic work … I'm not going to use the skills I have acquired from the advanced course (Tso 2).

Though attending training courses was necessary it would have been meaningful if what was learnt in the training was applied in their daily activities.

5.4.2. LEARNING

5.4.2.1. Incubants' learning during the GS internship project

Wenger and Lave (1991) argue that learning should be seen as participation. When incubants were asked what they had learnt so far, the first response was 'a lot'. The follow-up question allowed for them to elaborate so that they could be more specific. The incubants who did not go to any training course and did not engage in the projects that were GIS based in the first semester of the project, especially Tumi and Calvin, could not clearly separate the learning that they acquired through having attended training courses from what they were actually learning daily in their workplaces. This meant that they regarded learning what related to GIS otherwise everything else was just routine. I suppose it was also because they had their own expectations:

> But I learnt a lot (about it here) it's just that it's not as much as I hoped I would (Tumi 2).

For instance Calvin said:

> I haven't done anything so far (Calvin 1) … I haven't received much (activities) to do regarding GIS … maybe it is because my supervisor is not a GIS person (Calvin 1),

And Tumi said:

> In terms of GIS I learnt a lot from the day I got here until now (Tumi 1).

Tumi had worked at a part-time job and Tso was fresh from University both mentioned that the learning and understanding of GIS at University was different from the learning and understanding of GIS in a workplace in a sense that at University the learning was theoretical, it was about basics, there was no individual urgency, there was no time to be analytical about what you were learning and there was no time to practice on your own (Tumi 1; Tso 1). Thus there was no real-life application of theory which would have influenced the opportunity for creativity.

While Tumi and Tso were excited and adjusting to the workplace learning, MacD and Calvin, demanded more responsibilities because they felt that:

> I know them [how the workplace operates] … so it didn't take me long to adjust because I'm from a working environment (Calvin 1),

And MacD said:

> If only they can increase that notch a bit (i.e. stipend) … because the more responsibilities you get, the more the work you receive, the more you would need to earn, and the more the problems tend to increase (MacD 2).

This data demonstrated that newcomers in CoP enter at different points/stages of development because of prior work experience, thus not all newcomers in CoP are 'new'. They can be 'new' in the institution or environment but not 'new' in COP, and vice versa. This however did not negate that Tumi did not learn anything in her part-time job (which she thought had nothing to do with GIS) however it qualified her to be a step ahead of Tso because Tso found it challenging to be punctual and focusing on doing the actual work:

> Doing what you supposed to do, not wasting time on WhatsApp and Facebook (Tso 1)

What the interns learnt differed from person to person according to their roles and responsibilities (see Theme 4) and apart from improving that, the new insights were that for those who did not have resources like Tumi and Calvin the learning was slow, and for those (Tso, Nomsa and Manalane) who were integrating business into GIS applications did not have a clear picture of what business entailed in the beginning but later applications fell into places. They were being exposed to seminars about sustainable development, green economy and its opportunities, financial management, etc.

5.4.2.2. The incubant's learning progress (professional and personal growth) from the mentors' point of view

The incubants could only tell so much about what they were learning the mentor's views gave weight to their learning progress. Thoko, MacD's mentor, mentioned that MacD was able to synthesise the project's bigger picture, he was able to work independently and network, he could give good feedback, he presented the posters well, he was able to search for information and learn on his own, colleagues could go directly to him to ask for advice, their colleagues had confidence in him and:

> you don't need to start a new intern now and again … for instance now when we get the intern from NRF (12 months internship), MacD will be the one who will work more closely with that intern without me needing to be there because of the investment of having spent so much time with him (Thoko 2),

However he still needed to polish up on his accountabilities, participate in workshops and gain confidence in presentations.

Tumi was committed, efficient, focused, proactive, and she (like Calvin) knew technical aspects about GIS especially the one from ESRI software. Calvin, unlike Tumi, was "very difficult to get" (Treve 1) so there was little that Treve could tell about him. He also had potential but did not like open-source learning and had submitted his application to be registered with the GIS body, PLATO. His background of specialising in GIS until a Honours degree and his experience of working as an intern (unlike Tumi who studied a broader

geography and geology BSc degree) had put him in a better position of being marketable and being qualified as a recognised GIS specialist or technician with PLATO. Although they had these capabilities Treve argued that:

> what I am seeing with our interns generally is that if you leave them alone for too much you will inevitably going to end up with problems in terms of direction and so on (Treve 2).

They still needed to be guided.

There was no data about how Tso and Lebo's learning progressed especially in the second semester. However their mentor, during the first interview, mentioned that they measured the incubant's progress on a daily basis but it depended on the magnitude of the task. As she said:

> In terms of evaluation what they do is that they have to submit the weekly and monthly report … what is expected from them and what they expect from us … and what they have done until now … I get them [reports] now and then when there is something new to report … I told them to report only when they have new stuff to report … because they have day to day duties which is not necessarily to report weekly but if they learn a new skill or new course then they can report to say they have improved (Sofia 1).

Again when they conducted a profile analysis and personality analysis for each incubant, they could identify who was good at which skills of GIS so that they could make proper interventions. Mosidi in the end got a job in GIS, so her capability enabled her to get a permanent GIS job.

5.4.2.3. Learning experience of mentors

Mentoring is a chain of 'passing on' knowledge, skills and experience (i.e. practice) so as to distribute the benefits (http://www.admin.cam.ac.uk/offices/hr/ppd/pdp/mentoring/what/, extracted on the 11/08/2014). This means that the agents, i.e. mentor, and recipient, i.e. mentee, continue to share learning, continue to influence learning and both have a mutual investment in learning (Wenger, 1998a). Also because the practice in CoP is temporal in dimension, the

roles of agent and recipient of learning interchange e.g. the mentee at some point will become the mentor of someone else and the mentor at some point was a mentee. Wenger (1998a) also pointed out that in order for the practice in CoP to be relevant the participants should be mutually accountable for producing and reproducing knowledge and creating new meanings.

First and foremost the mentors continued to learn how to mentor simply because the mentoring approach of GS was different from what they were used to (elaborated further below, refer to Theme 16: mentors' views about the differences of GS internship from any other internship). For instance Thoko learnt how to prioritise and be 'up to date' with administration work required for reporting and keeping records of the incubants' performance, she learnt management skills which were never her core responsibility in her mandate before, she learnt to be patient and clear and concise when giving instructions, and she learnt how to assist an incubant in how to engage in meetings. Thoko said:

> I think the assumption that everything is easy ... people should just understand that its quite a learning curve for me … and just the whole mentoring skills that I'm sharpening, and my interpersonal skills, (for instance) learning to be patient enough, and be clear and concise about instructions so I can get effective deliverables of what I want or need him to do … patience is a virtue … they [mentors] need to set up that time on the side … but these other [mentor workshops] engagements sometimes you might benefit and sometimes you may not and therefore you will need to prioritise based on your interns learning abilities and time … but I know that you do learn some things from other people's challenges (Thoko 2).

Treve on the other hand was learning how to understand personal learning preferences of incubants, how to make the incubants' lives easy within the means and conditions they work in, and trying to guide them to find their own identity (Treve 1). Treve said:

> My feeling is to rather look at what their job requirements are … and really cater to their needs and focus on their budget … because if you have R66.000.00, you sit with them and plan the budget … and that's part of the learning process as well ... I'm not pushing them to any direction but I'm giving them options, but what I noticed with Tumi she is grabbing options … and it looks like Calvin will do the same (Treve 1).

Even though the mentors identified these skills and knowledge and competencies as qualities that they have learnt, in the first interview there was a sense of a ***hierarchical activist*** attitude more especially from Thoko especially during the first interview, when she said:

> I get angry if he pitches in my office to ask me about something and he is not carrying a paper or notebook or anything ... I actually went to an extent that I will not answer him if he doesn't have anything … because the problem is once I answer him … when he walks out my office, he will forget and he will come back again … and I don't work like that, I tell you once … unless you don't really understand certain things like administration stuff … there I can help you (Thoko 1).

Here she explained the relationship, especially during learning, between the mentor and incubant the mentor doing the teaching and the incubant being a receiver - learner. She was also, at that time, demonstrating that the qualities that need to be taught have to be job-related as a result the notion of learning in internships to her was only about the intern/incubant doing the learning, not her. However later in the second interview she recognised that not only do mentors have to impart/transfer the qualities that are job-related to incubants but they, the mentors, also learn or develop not only job-related qualities in workplaces but also personal qualities, as she said:

> He made me aware that I'm impatient … and now I'm starting to be really patient … and maybe probably not a good facilitator in meetings (Thoko 2).

Again we also see the ***hierarchical activist*** attitude from Sofia when she said:

> I hope for their sake they will grow in their skills … I hope for their sake that they will be better employable … especially having been trained here in ESRI, they will certainly find it easier to find job (Sofia 1).

Here Sofia is not reflecting on what they as an organization or mentors would have learnt from the incubants experiences.

Treve on the other hand started off by being open to learning [understanding that learning does not occur in one way where the master imposes his expertise on a newcomer but in understanding that allowing learning to take place from the personal experience of the learner and contribute to this as an expert/master in practice or a judge of competence], as he said:

> Look it's not difficult for me to find information … So they can always find their way around on the geodatabase quite easily … we end up giving each other tips (Treve 1).

He was also open to giving the incubants as much knowledge, skills and competencies as he could even if they were not part of the organizational mandate with the aim of preparing them for GIS competencies in general, as he said:

> so if they want to get training or to do whatever I will definitely support them even if it's slightly off … not necessary for us as long as it's going to make them better as persons … also if they want to do it and they are happy …s o that's what I'm getting myself at (Treve 2).

Again, Thoko also realised that to be effective in mentoring, a mentor should be *willing* and *patient* (Thoko 2), a mentor should have the best interest at heart for the incubant's development. She further said that:

> plan that you want an intern and plan what the intern is going to do … and plan how you are going to facilitate his/her training, and look for funding for your incubant to attend conferences, forums and so on (Thoko 2).

I found the latter statement significant however it would be more meaningful if both the mentor and incubant planned the training together because later in Theme 15, we learn how the synergy of mentor and incubant could propagate effective learning.

5.4.3. EVALUATION

5.4.3.1. Incubants' evaluating system for their own progress

According to Wenger members of the CoP keep checks of their participation in CoP by continuously evaluating what matters to their development to actually belong to the CoP and stay active in the practice. There were different ways in which incubants evaluated their development, they kept documents as points of reference, comparing learning experiences from previous CoPs to the present CoP, and searched for validation (social interaction-exchange) from the members of the CoP.

When the incubants were asked how they assessed their development, they all used the work plan and monthly/weekly reports as points of reference. They measured if all the tasks planned were executed. Thus if the tasks were accomplished but did not correspond to what was planned, then it was not considered as part of the development. Though they all mentioned the work plan or the monthly/weekly reports as the way of tracking their development, they only send few copies as evidence, which I had asked in the beginning for all the months or weeks between November 2013 and May 2014, for document analysis purposes. MacD only submitted one copy of one month project report. The example of the reports submitted by the incubants are as follows:

Groen Sebenza

Incubent

Report

A quick overview on the Mapping of Rehabilitated Wetlands and its Interventions Project from the past four years started on the year 2012. The project was done and submitted on SANBI BGIS site under the inventory page towards mid of 2013 with success, for more information visit the inventory page, http://bgis.sanbi.org/nwi . I then changed divisions from W4Wet programme to Freshwater Programme where I got involved in Mpumalanga Ground-trothing Project. Its main objectives are to develop standardised methods for ground-trothing which can be applied province-wide, for the long term goal of strengthening of the National Wetland Inventory of South Africa. The focus is to update wetland spatial boundary and attributes or information associated with each wetland following these steps: Desktop preparation assigned 40% of project time; Fieldwork assigned 20% of project time and Desktop follow up assigned 40% of project time. The project focusses on certain catchments in Mpumalanga province, from these catchments one objective of an inventory is to comprehensively cover entire catchments, this might mean collecting less data on more wetlands, rather than more data on fewer wetlands, so as to achieve the goal of a complete catchment dataset. The following are my Key Performance Areas

	KEY PERFORMANCE AREAS	WEIGHT (%)
1.	**Develop the GIS shape file and maps for the Working for Wetlands rehabilitation projects**	15
2.	**Assist in improving the National Wetland Inventory data**	15
3.	**Provide support to National Wetland Inventory Projects**	20
4.	**Assist on the WRC funded Mpumalanga Ground-truthing Project**	50
		100%

Figure 25: MacD's monthly work report he submitted.

Calvin sent one copy of January 2014 daily and planned activities,

DAY TO DAY MONTHLY REPORT
[redacted] - 1 January 2014 – 31 January 2014

DATE	WORK PLACE	ACTIVITY	PLANNED ACTIVITY	ACHIEVED Y/N	OVERTIME
1	HOLIDAY				
2	Office	Reading articles on working with Geodatabases and ArcSDE	Working on Geodatabases and Assessment reports	Y	
3	Office	Reading articles on working with Geodatabases and ArcSDE		Y	
4	WEEK-END				
5					
6	Office	Compiling the monthly and quarterly assessment reports	Working on Geodatabases and Assessment reports	Y	
7	Office	Compiling the monthly and quarterly assessment reports		Y	
8	Office	Compiling the monthly and quarterly assessment reports and sending it to the supervisor for assessment and recommendations		Y	
9	Office	Working with shapefiles and adding metadata on shapefiles(water resources, freshwater ecosystem and protect areas) for the purpose of creating Geodatabases and for quality assurance w.r.t GIS Data		Y	
10	Office	Continuing with working with Geodatabases and metadata Assisting an ecologist with creating a wetland polygon in Nylsvley Nature Reserve by digitizing and creating a map showing the location of the wetland with the reserve		Y	
11	WEEK-END				
12					
13	Office	Creating an excel spreadsheet containing all the information with the Geodatabases	Fieldwork	Y	
14	Witklif	Lizard Monitoring (fieldwork)		Y	
15	Office	Attending a workshop on Game reduction		Y	
16	Office	Sorting out the desktop and removing all the garbage and duplicates to ensure an efficient GIS System		Y	
17	Blouberg Nature Reserve	Lizard Monitoring (fieldwork)		Y	
18	WEEK-END				
19					
20	Office	Working on geodatabases	Fieldwork	Y	
21	Office	Working on geodatabases		Y	
22	Office	Working with geodatabases and metadata		Y	

Figure 26: Calvin's January work report he submitted.

And Tumi sent a couple of documents which included the weekly report for November, the National Induction Training report, monthly reports for December 2013 and January 2014, and the memorandum of understanding on performance of the October 2013 to March 2014 (Refer to document analysis in Chapter 3 for detailed analysis).

DAY TO DAY MONTHLY REPORT

1 December 2013 – 31 December 2013

DATE	WORK PLACE	ACTIVITY	PLANNED ACTIVITY	ACHIEVED Y/N	OVERTIME
1		WEEKEND			
2	Boksburg	Attending Induction		Y	
3	Boksburg	Attending Induction		Y	
4	Boksburg	Attending Induction		Y	
5	Boksburg	Attending Induction		Y	
6	Boksburg	Attending Induction		Y	
7 8		WEEKEND			
9	Office	Assisted Ecologists with locating farms on the Conservation Plan.		Y	
10	Office	Categorization of the GIS Data		Y	
11	Office	Read up about Policy Making	Field work at Blouberg Nature Reserve	N	
12	Peter Mokaba Stadium	Mandela's Provincial Memorial Service.		Y	
13	Office	Sorting out the data for the Geodatabase		Y	
14 15		WEEKEND			
16		PUBLIC HOLIDAY			
17	Office	Assisted Ecologists with locating farms on the Conservation Plan.		Y	
18	Office	Projecting shapefiles to Haartebeeshoek projection.		Y	
19	Office	Assisted Mr Blignaut with the verification of Game Census results.	Projecting shapefiles to Haartebeeshoek projection.	N	
20	Office	Assisted Mr Blignaut with verification of Cunning results for most of the Nature Reserves within the Province.		Y	
21 22		WEEKEND			

23 24	LEAVE
25 26	PUBLIC HOLIDAYS
27	LEAVE
28 29	WEEKEND
30 31	LEAVE

Figure 27: Tumi's December work report.

25-29 November 2013

This week has been more or less the same, we're still busy with creating a Geodatabase and that's what is consuming most of our time. The problem is, most of the data is outdated and does not have metadata (information about the data i.e. who created it and when?). The department has not been collecting data in the field for ages and we just have to work on what we have. It's been quite a challenge because most of the data is not projected and therefore cannot be used; data with different projections will give you the not so true output. And another thing is that we need to figure out what data/shapefiles should be put on the Geodatabase and what needs to be removed from our folders completely.

It would be great if we were to do our own small projects where we go to nature reserves and map their boundaries, roads and other features that might be there so that we create our own data from scratch. Obviously it's going to be time consuming and will need a lot of effort from us but I think it's something we can do. I think there's lots that still needs to be done in terms of GIS in our department but with time and hard work, we can go far.

On Wednesday all the SANBI interns had a meeting with our newly appointed Project Coordinator, Vuyi Thabethe. We tackled some of the issues we've experienced since we got here and how there's been a lot of miscommunication between the parties involved. She told us that she going to do her best to ensure that from now on things change for the better. She said that 10% of our annual budget has been deposited and we will be getting protective clothing soon. She also asked us about computers, whether we wanted laptops or tablets. Apparently the laptops/tablets will be bought with the next money deposited by SANBI. From the meeting, I got the feeling that things are going to get better from now on. Hopefully all will work out well.

After the meeting we went on a fieldtrip to Moletjie area to trap flat lizards in granite koppies (little mountains). One of our duties is to assist Vincent with fieldwork, even if it's not GIS-related. I was really interested to see how things would go because this is something I have never done before. We got there just before noon, it was blazing hot. We climbed the first koppie, apparently their favourite habitat is the cracks along the granite rocks. We had little thin wire traps created by Vincent; we looked and looked but couldn't find the main lizards we were looking for. We continued the koppie and it became harder as we went up because some of the rocks were slippery and the vegetation was a bit dense. We managed to go up but still could not find anything. We decided to go down and continue the search on other mountains.

We went to the Moletjie Nature Reserve, not really an interested place. Seems like the reserve is not managed and has not been looked after. We went another koppie and continued looking for the flat lizards, still could not find anything. We just looked around the area just to make sure we cover most of it. Later on we decided to go back and that was it for the day.

On Friday we had a mini braai as an end of year event. It was nothing big and it was just the Biodiversity Management section, less than twenty of us. I had a great time, it was good to just chill and enjoy boerewors.

Figure 28: Tumi's weekly work report.

02-06 December 2013 (Induction Week)

Induction week has finally arrived. We left Polokwane around 10:30 am and were all excited to get to Birchwood Hotel. We arrived just after two, got our keys and checked in. We later went for supper and the food was delicious. I had an early night since the induction was starting early the next day.

Day one was just about creating a clear picture about how we fit into the Environmental Sector, SANBI and as Groen Sebenza incubants. I just made things clearer and gave me a sense of belonging; it's good to know that we are actually part of something big that is playing a very significant role in conserving and looking after our biodiversity.

Day two was a great day; I never knew how important it is to build your personal brand until I heard Karl Smith give a talk. It's crazy how the little things we tend to not give much attention may either make or break our image, but I'm glad I was there. I have learned so much, and I feel so motivated. I want to create the kind of personal brand that will advertise itself. I've also learned a lot about networking, I'm not usually the kind of person who approaches people but we were given a task during the talk to someone you've never spoken to and I actually went to some lady and started a conversation with her. It actually felt good.

Later on we had a talk from Old Mutual about handling our finances; it was really eye-opening. Saving is not an easy thing to do, especially during this time of the year. But I want things to change with my finances; I know that I can do it. It's just matter of actually doing it; it's going to take a lot of discipline I think it's doable.

The interesting part about day was when we were divided into groups according to our different professions. I'm more interesting in GIS than when I came here, there's a lot to be learned and discovered and I'm in this for the long run. The main thing I learned is that I need to increase my appeal as a GIS Technician, one can never stop learning and it's very important to grow one's knowledge and work on the different skills that are needed to be the best in the field.

Friday was enlightening in terms of the history of Botanical gardens in South Africa, I didn't know much about this and now I can proudly share about it. Unfortunately we left after this talk since some of our groenies were going to far places like Musina. We had a great trip back home and family was really excited to see me.

Figure 29: Tumi's report about the December 2013 induction training.

DAY TO DAY MONTHLY REPORT

1 January 2014 – 31 January 2014

DATE	WORK PLACE	ACTIVITY	PLANNED ACTIVITY	ACHIEVED (Y/N)	OVERTIME
1		PUBLIC HOLIDAY			
2 3		LEAVE			
4 5		WEEKEND			
6	Office	Compiled monthly and quarterly reports.	Working on the Geodatabase.	Y	
7	Office	Compiled monthly and quarterly reports.		Y	
8	Office	Assisted an Ecologist with assessing the conservation status of an area for an EIA using GPS coordinates, and created two maps showing the vegetation units and CBA categories. Worked on the Geodatabase.		Y	
9	Office	Created Geodatabases for the following categories; Water Resources, Transportation, Biodiversity, Cadastre etc. Added Metadata water resources shapefiles.		Y	
10	Office	Assisted an Ecologist with creating a polygon for the wetland at the Nylsvley Nature reserve through digitizing. Created an excel spreadsheet containing the information from the Geodatabases.		Y	
11 12		WEEKEND			
13	Office	Continued working on the Geodatabases and the excel spreadsheet. Read about GAP Analysis for Conservation Areas.	Working on the Geodatabase.	Y	

14	Witklip	Lizard monitoring (fieldwork)		Y	
15	Office	Worked on the Geodatabase. Game Reduction workshop.		Y	
16	SICK LEAVE				
17	Blouberg Nature Reserve	Lizard monitoring (fieldwork)		Y	
18 19	WEEKEND				
20	Office	Compiled notes/minutes for the Game Reduction meeting. Worked on the Geodatabase.			
21					
22					
23					
24					
25 26	WEEKEND				
27					
28					
29					
30					

Figure 30: Tumi's January 2014 work report.

Tso, Lebo and Mosidi did not submit any reports.

The above documents show that the incubants in different organizations had different reporting systems. Also it was interesting to see that even though Tumi and Calvin were in the same organization and supervised by the same mentor, they too had different ways of submitting their reports.

However after receiving these documents I became concerned so during the second interview in May 2014, followed up on why the documents were not submitted. MacD and Tso mentioned that they had been busy that they did not have time to do the reports because their responsibilities required a lot of administration work which they had made a priority. As MacD stipulated:

> It's very difficult to forward those documents to you … I'm sorry about that … considering the pressure that I'm working under … and the project we are currently busy with ... it is really demanding … I'm trying by all means (MacD 2).

The data raised interesting issues around the reflexivity of incubants on their progress and participation, and issues around juggling between creating meanings for their own development and conforming to the demands of the job. For instance if a work plan or monthly/weekly reports were important and useful for examining their progress, why then did they choose to delay recording them and chase after meeting the deadlines and perform other actions instead?

Calvin, in addition, mentioned that he evaluated his progress by comparing the skills and knowledge he acquired from his previous job to the ones which GS have improved on or instilled. He also compared the time he took to acquire those competencies and perform activities from his previous job with his new job. However he did not have any form of record to reflect on besides the work report template provided by the organization or mentor. MacD and Tso mentioned that they assessed how their colleagues responded to their presentations, MacD further stated that he also realized that he was developing because his team gave him "serious tasks" (MacD 1).

5.4.3.2. Mentor's evaluating system for incubants' progress

Mentors, Thoko and Treve, preferred to use a system of monthly reports but would prioritise the six months performance evaluation system consisting of Key Performance Areas (KPA's) as a tool to assess the incubants. This was a tool that was generally used by the rest of the department, both SANBI and LEDET, since the performance reporting system invented by GS was not ideal as it entailed a lot of administration work. The department system worked for them because they, the mentor and mentee, could both discuss issues. These was supported by Thoko when she said:

> I believe it's the first time this kind of GS project is done [in the sector], the whole thing about how they do job description, performance evaluation, just learning from the system because it is slightly different from what SANBI is using or even the NRF's … but again its adding more admin when trying to get on board with it (Thoko 1)

And Treve said:

> We have used the GS [evaluation] system … which is not all that fantastic … at the moment because I am assisting for something that I wasn't around for, and I didn't really do much … so we have kept our normal Key Performance Areas (KPA's) (Treve 1)

Thoko further mentioned that instead of keeping a diary she would rather keep a notebook where she inserted meetings' proceedings, appointments or issue follow-up entries, reminder notes, with dates so that even when she was no longer working for that CoP someone else could use it as a guideline (Thoko 1).

Sofia, a mentor and manager at ESRI, said that she preferred to evaluate the incubants on a daily basis because they are given tasks which need to be delivered on a daily basis , however if they were her employee they were supposed to have signed a performance agreement with a job description. She said:

> We evaluate them on a daily basis … work given work delivered then quite happy … have you done what I have asked you? Have you attended the course you supposed to

> attend? Have you passed the course? And so on … in terms of data…is the data okay? Is it properly structured? … It is all about 'Did you do it'? (Sofia 1).

Here the data demonstrates that evaluating incubants of different backgrounds and needing different interventions cannot be standardised, because they start their training at different levels.

5.5. ORGANIZATIONAL CULTURE AND SUPPORT (INCLUDING MENTORS' MENTORING STYLES)

5.5.1. *Culture*

Wenger (1998a) described practice as "a shared history of learning" in essence practice has a culture. One aspect of the culture of practice is that it should allow incubants to create their own culture so as to reconstruct the practice themselves. Thus incubants need to see for themselves what practice is, and how it is influenced and influencing other activities or objects, and how the members of the practice or members outside of the practice relate to each other. By so doing the culture would shape the values and norms of incubants as they negotiate their participation and membership. Participation and membership in this case take form on different levels which included the institutional level, departmental or team level.

In the same way participation and membership take form, culture also does. In this case, culture is shown to be dynamic and structurally nested, and was represented in different levels from micro (e.g. individual -team culture) to macro (e.g. organization-sector-global practice culture) levels. These levels affected each other and had "implications for work behaviour" (Erez & Gati, 2004, p. 584), at the same time it has implications for how incubants learn and develop identity. For instance:

The institutional structure influencing culture: - the workstations for incubants at ESRI, SANBI and LEDET, were placed in one office away from their mentors or any core members workstations and because of that, to some extent, the arrangement enforced interaction amongst incubants as well as limiting regular interaction with other members of the team.

This was supported by Tso from ESRI when she said “and as for my colleagues ... we are not really used to them … like the rest … they are in an open plan and we are in the office … so we are kind of like in isolation from everyone else” (Tso 1).

And Tumi from LEDET said “[we are placed in] more like a store room and we don’t have anything in here … I think our relationship [as incubants] is great ever since I came here I haven’t experienced any trouble … we do work well together” (Tumi 1).

The culture of how members of the institution treat the newcomers/incubants: - The tensions that occurred between members and non-members (i.e. incubants) at LEDET created cohesion between non-members which encouraged harmonious communication and better relations.

By being a large group of incubants appointed in the same department and experiencing a similar situation, creates an easier environment in the organization for the newcomers/incubants as individuals. This was demonstrated at LEDET (which had taken on many incubants as opposed to other host organizations) whereby the isolation between member and non-members of the institution was clear, this was demonstrated by Tumi when she said:

> But there is this thing in the department … it’s like we are outsiders just because we are SANBI employees … it’s like we are [employees] but we don’t belong here … for instance at the dry lab where we work we don’t have printers so if you go to another section and ask to print stuff … they will tell you that we are from SANBI/SANBI staff [then you are not allowed to print] … and I’m like seriously it’s just a paper why do you have to be like that (Tumi 1).

At ESRI it did not matter whether the newcomer was an incubant from GS or an intern from any internship programme, they were all treated the same, as Sofia said:

> They are all different … giving out workplace experience … we still treat the GS interns the same … we put them in our training programme … we give them some work … we put some in different training (Sofia 1).

The culture which emerged due to going through the same struggles: - The incubants at LEDET were experiencing similar problems, for example, they did not have resources and mentors for a very long time, so they identified with each other and the situation made them hopeful.

Also during the National Induction Training when incubants shared their successes and challenges in their respective organizations, many incubants who had the same challenges felt that they were not alone in the struggle. The most profound insight here was that because they recognized that other incubants in other departments and institutions were going through the same struggle gave them a reason to continue to be part of the GS project. Tumi from LEDET said "I don't regret it [to work as a GIS technician] … but I just think that the circumstances here have been unfortunate for me … but I have learnt" (Tumi 2) and "… what might be important to them [other incubants] might not be important to me" (Tumi 2).

Even Mosidi from ESRI mentioned that "it [the induction training] was also good … because they brought motivational speakers … and even when our peers shared their experiences … we got motivated that we needed to work our best and gain as much as possible … and that is what they were emphasising" (Mosidi 1).

The culture of how the incubants treated each other: - The incubants from SANBI and LEDET saw themselves as 'friends' or 'family' which indicated how personal the culture was to them. It also indicated some kind of attachment which to a degree was their pillar of strength and gave them the confidence of their being in the institution. Tumi for instance said:

> We as 'groenies' [another name for incubants] we do things together … and that's how it is … we are one big family … but like a said before, that there is this thing in the department separating us as SANBI people ... that is still going on ... but us as incubants we are good (Tumi 2; Calvin shared similar views). MacD said that:
>
> I meet people with different cultural background … we do have a way of communicating … e.g. we speak different languages but we do become friends … so we do have a way of accommodating each other (MacD 1).

The culture of how GIS 'core members' or team treated incubants: - This culture either made the incubants feel 'partly' belonging or made the incubant feel 'completely' belonging to the team. This was supported when Tso from ESRI said:

> But because I'm an intern I don't get to use all of those skills that I get … the problem with being an intern is that there is a certain level that in a workplace that you cannot be given (Tso 1).

A contrary view was expressed by from MacD from SANBI who said "firstly they don't treat me as an incubant … sometimes I even forget that I am at the lower level of the chain ... they take me seriously … the way they do it, when they hold meetings for instance, they give me "serious" tasks in order for me to see myself as active as they are … they always keep me within their boundaries … so I do not feel left out or feel I cannot contribute … I always feel I am part of the team" (MacD 1). This also shows that even if you are alone and being supported, the environment can allow the newcomer/incubant to cope.

The culture of individual urgency/perception of themselves in relation to the whole institutional environment: - Regardless of what the incubants knew about what was expected of them from the institution or GS they were still able to select what mattered for their own development. For instance Tso from ESRI said:

> You know … because we are based in our office with our mentor and our mentor is great … we don't care about what happens outside of the office (Tso 2).

Also Tumi from LEDET said:

> Though my main goal wasn't to be in this sector … but over the past few months I sort of grown and loved this kind of environment like the whole thing about biodiversity and conservation … but I mean I did geology and that was my passion … that's what I wanted rocks (as she speaks of geology her face was glowing and you could feel her passion in her tone) … but now I see things differently … and I'm like well okay … just everything and how it fits together … and now I just realised that it's also fitting with geology ... it's just everything in one place (Tumi 1).

The culture in itself was able to propagate a sense of belonging which ultimately encouraged the development, negotiation and transformation of identity. However the

manifestation of identity is a process, Wenger (ibid) spoke about three different modes of belonging which includes *engagement, imagination* and *alignment*. This was evident from MacD's progress in the GS training at SANBI, by seeing how he was involved in meaningful projects, and how envisioned what he wanted to be in the future and also taking necessary steps to ensure that he fulfilled his dreams. For instance, he managed to finish his wetland project and presented it during the wetland indaba. He also wanted to be a recognised GIS technician and in order to become part of the profession he is engaging with PLATO so that he can register. We also have an example of Calvin from LEDET who also understood what his needs were, in order for him to become a recognised GIS technician. He identified what engagements he needed so that he can fulfil his dream of becoming a GIS technician. As he said

> I'm supposed to be just doing GIS stuff … collecting information … making sure GIS … to render GIS support … like assisting the ecologists with reviewing their EIA … maybe to check what is there … and I give them that spatial information … in the areas they want to make development … this is what I'm supposed to be doing … I expected a lot where I work in a team with a suitable mentor who specialise in GIS and … have enough resources to carry out my duties … I expected to acquire as much knowledge as I can so I can be marketable ... so that I can be able to register with PLATO … as a GISc Professional Practitioner it is very important to register because if I don't register I will find it very difficult to ascend/grow in the field of GIS (Calvin 1).

It was evident from the data on culture that in most cases organizational cultural practices were more visible or easily picked up in situations where there were more incubants in the same organization. This was observable particularly at LEDET.

5.6. SUPPORT

5.6.1. What kind of support did incubants receive, from inside or outside of the CoP they inhabited?

There was a range of support for the incubants.. For instance there were material and intangible support from the team, mentor or institution that were needed for executing

their daily activities. Also there was intangible support from family, friends or colleagues that were needed for them to stay encouraged and find value in what they did in the workplace. The support received varied from individuals. For example:

Material support received from mentor, team or institution includes: - resources for doing a job e.g. computer, training (MacD); budget (MacD); alternative work (Tumi).

Intangible support received from mentor, team or institution includes: - motivation (MacD), people showing interest in the work I do (MacD), advice (Tumi), suggestions (Tumi), finding better solutions (Tumi), availability and assistance of other team members (Tso).

Intangible support received from family, friends or colleagues includes: - motivation (MacD, Calvin), encouragement from a colleague (Tumi); availability (Tumi); telling what they needed to hear (Tumi); "spiritual, religious and motivational support" from his mother (Calvin 2).

5.6.2. Mentors' mentoring style(s)

The process of mentoring has different goals and creates different relationships between the mentor and incubants (Mumford, 1995). There are consequences to this in that these goals and relationships can destroy or oppose the learning styles of the incubants, opposition however is also good because it can bring new opportunities for learning. These goals and relationships also can *encourage or discourage the incubants to participate* in CoP/institutions, and if they do participate they can affect *how* they participate. Here I used the definitions of types of mentoring used by Mumford (1995). He explained four kinds of mentoring which includes; *activists*, *reflectors*, *theorists*, and *pragmatists*, which are defined in Chapter 2 and I found them very useful because the evidence from mentors' statements revealed similar styles of mentoring. Even though I did not conduct any in-depth follow-up questions about their mentoring styles, it was not difficult to trace their style of mentoring from their and the incubant's comments.

Thoko's mentoring style leaned strongly to the activist and pragmatist side. This was demonstrated when she said:

> I actually went to an extent that I will not answer him [the incubant] if he doesn't have anything … I don't work like that, I tell you once (Thoko 1), and I teach him… [all these] so that [when he is no longer with us or with the project] someone can pick up from where he left off … once in a while I may want them … and if they are not there, I will not take [accept] that … so he will have to make a plan to produce them (Thoko 1), she also added that I prefer a notebook more than a diary… [I write everything in it] ... so even if I'm no longer there you can read my notebook and be able to follow up … I encourage exactly the same thing to him (Thoko 1).

These statements reflect an activist's style of mentoring because Thoko was more directive and gave solutions rather than discussing the matter at hand with the incubant. She did this because she had learnt from her own experiences and because they had a history of working together prior to the GS project. At the same time she was being pragmatic, this was supported when she said:

> We have not used the Groen Sebenza budget, I think it was my first time using it for him to attend this forum (biodiversity planning forum, 2014) … otherwise for all other things I always [make means to] find sponsors from other institutions for him. I always look for those opportunities in projects that are taking place … and check if they have a budget set aside for training young scientists, [I ensure] he becomes part of those scientists who benefit from it (Thoko 2).

This reflected a pragmatist style which involves "searching out new ideas or techniques which might apply in their situation" (Mumford, 1995, p. 5).

Treve's mentoring style took more of a reflector and theorist approach. Mumford (1995) describes a strongly theorist mentor as someone who is "interested to range over a wider field of discussion and understanding and keen on assumptions". A strong reflector is someone who "likes to stand back and review experiences from different perspectives and enjoy observing other people in action before making a move". This was demonstrated by when he said:

> I'm not pushing them to any direction but I'm giving them options, but what I noticed with Tumi she is grabbing options … and it looks like Calvin will do the same … but I'm giving them options … I'm very aware of kind of pushing people to do the kind of stuff I want to especially when going to higher degrees and halfway the thesis they end up bored, or they just not interested or whatever … so I'm really living it quite open … I'm not trying to say we need this job done (Treve 1).

The most important point in this theme was not to see what style was better but to see how the styles can complement each other and become effective. Moreover it was to see if both the mentor and incubant understood each other and "understood the principles of learning" (Mumford, 1995).

5.7. ACT OF CONFIDENCE, COMPETENCE AND EMERGING BENEFITS

5.7.1. *The incubants' confidence, belief and competencies in their abilities*

This theme complemented the previous theme, Evaluation, because the way the incubants evaluated themselves should have been aligned with how they enhanced their competencies. However examination of competencies should not only be about evaluating and enhancing certain skills and knowledge in order for mastery of the occupation but should also incorporate:

1. The strengthening of abilities to network with other members of the COP,

2. The continuous contribution and accountability to the interests of COP, and

3**.** The continuous engagement and use of the skills and knowledge so as to create new meanings (Wenger 1998a).

Wenger (1998a) described competence as something that needed 'to be experienced and manifested by members through their own engagement in practice' and can only be claimed if the individual or community <u>understand what the CoP is</u> about and <u>only the CoP can determine whether a member is competent or not</u>. The latter statement is central to explaining the whole argument of this study. This was also the reason why in the literature review (Chapter 2) I inserted a section which talked about the GIS industry, market and trends (i.e. demands) in order to see the skills and knowledge negotiated in the broader field of GIS.

In the beginning of the interview when incubants were asked about *how they would rate their competencies, abilities and confidence so far* they only recognized one mode which

they used to measure competence. The mode was how they had developed as peripheral participants and how over time the participation had influenced their mastery of skills needed for the occupation. This reason however was not enough for the argument of competence described by Wenger because competence does not only happen mentally but also has to also be in a form of situated experience, i.e. meaningful engagement in the community of practice and properly using the repertoire of the community (Martins, 2013). Afterwards in the interview when they gave account of their *career plans and how they empower themselves to improve the GS experience*, each provided different dimensions in which manifestation of competence became noticeable, for instance the following traits have shown inherent signs of competence:

- urgency to seek approval from the core members or mentors,
- behaving in a manner that was professionally and morally acceptable in the COP, e.g. "I am working hard daily to impress my bosses and the whole division ... trying to organise myself daily … like being punctual, time management, and I try to have the best behaviour so that people can be happy when I am around" (MacD 1).
- registering with the South African Council for Professional and Technical Surveyors (PLATO) body to become a recognised GIS technician,
- enhancing education qualification to be recognised for e.g. Tumi applied for an honours degree with UNISA in GIS and remote sensing in April 2014, and Calvin was considering studying further but he is still figuring out what GIS related project to study, Tso also wants to enhance her BSc degree,
- Tumi was teaching herself computer programming through free online courses, studying free online GIS courses with tutorials for practicing and she was using the open-source GIS software e.g. Quantum GIS, just so as she can keep in touch with the technologies of GIS field.

Confidence on the other hand was induced by many other things for instance, MacD's confidence was strengthened by having a good motivational mentor, exposure to different activities, conducting presentations, contributing and participating meaningfully to projects, attending training courses that were applicable to his daily challenges and assisted in problem solving and finding new ways of finding solutions, and finally being given challenging tasks.

As far as confidence was concerned, data revealed that the incubants' confidence was induced by different elements in the CoP's they inhabited and was also depended on the variety of characters which included: - *the personality/attitude*, - *availability of resources*, - *time* (e.g. history of working experience from previous CoP e.g. Calvin said:

> I am [confident] … but not that I have acquired the skills from here [LEDET] … I have acquired them from the previous internship … I learnt a lot from there … well I know the system [GIS program] a lot and how to use it … but I would not say I know it 100% but let's say around 65% because there is still more to learn (Calvin 1).

As for *personality/attitude* Tumi said:

> I do have confidence … because I'm one of those people who don't let anything get them down ... I work hard until I get to where I want to be ... even if there are things I might not know … but I will make efforts to know them … (Tumi 1). Like you know when you are faced with a problem you can either turn a blind eye … or you can create something better out of that problem (Tumi 2).

And - *choices* (i.e. as the incubants become more exposed to different activities in the field and engage with them, the more confident they get and the clearer their identity). For instance, MacD and Tso have been exposed to a variety of activities in the GIS field, more than Tumi and Calvin, thus they sounded more confident and because MacD and Calvin have been in internships before, their confidence was strengthened. Again because Tumi was a 'go-getter' (or ambitious) kind of individual she was also confident about her capabilities.

Calvin and Tumi's confidence was not as strong as MacD's and Tso's because they did not have working equipment which made them doubt their abilities. This led to them feeling that they lacked skills and needed more training to improve. Similarly Tso's confidence was not as strong as MacD's because she felt that most of what she has learnt in GIS was not structured in a way that would be useful to the needs of her daily tasks. So the GIS skills and knowledge she acquired from training could only do so much in terms of her career pursuits. These data demonstrates that confidence is acquired in different degrees at different times and spaces. The question that needs to be asked to understand the term confidence was how confidence leads to meaning competence.

In this theme I intentionally included the descriptor belief, because I see it as something that can be separated from confidence. Generally it is thought that confidence is inseparable from belief, because belief is something that you cannot see in confidence. The data shows that it is possible to have confidence and still doubt your abilities (i.e. competence) but regardless of the doubt, overall you would still believe you can pull through in the end (i.e. self-assurance) (McPheat, 2010). For instance Tumi said:

> We do know but we are not in the level to say we are GIS experts ... we still have a long way to go (Tumi 1). I just think that the circumstances here have been unfortunate for me ... but I learnt a lot [about GIS here] it's just that it's not as much as I hoped I would (Tumi 2).

Also Tso added:

> [I think this 2.5yrs experience will equip me with abilities to start a business but only] enough to get a job but not enough to have my own consultancy … because I don't think people will have confidence in me … like to do consultant work, it's too soon (Tso 1).

In this case Tso expressed the fact that she has the confidence in that she knows she has learnt a lot on the road to becoming a GIS expert but circumstances would not allow her to consider herself as a GIS expert yet.

Yet again, in MacD's case circumstances did allow him (i.e. he is well trained) to have confidence in his abilities so that he even believed that he:

> Can face any vacancy interview at any time … I'm now fit to join other institutions, like government, private sector, etc. (MacD 2).

5.7.2. How has Groen Sebenza changed the incubants' lives?

Wenger (1998a) argues that in the process of finding meaning and identity in the CoP the newcomer/incubant keeps on transforming, whether the newcomer rejects or accepts the interests of the CoP, they do change the way they perceive things. The change of perceptions was not only applicable to how they wanted to grow professionally in the CoP but also included how they generally managed their lives. For instance they mentioned that the CoP has actually helped them in the following areas: in managing their own finances, in improving the functioning of their families and relationships, carrying out their cultural identity, achieving spiritual fulfilment, being hopeful of the future, and improving their social interactions.

The following quotes support these interpretation:

- It has changed their financial dependency into financial independence from their parents and are now able to manage their own finances, for example Tso said "I'm confident that when coming to my personal finances I got training, I know about taxes … like the stuff I didn't know before" (Tso 2),
- The GS improved the incubants' relationship with their family,
- The incubants are able to assist at home, even if not with major needs but they are able to do minor and essential things for instance Tso was able to provide her younger siblings who were in University with pocket money
- It has changed their love life with their partners (MacD and Calvin), for them as black men it was important in their culture to have the ability to provide in a relationship,
- It made Calvin's family proud because :

  > You know I'm the only one in my family who was able to acquire a tertiary education … so it's been good because I'm able to assist at home with groceries and some stuff wherever I can … I am the last born at home (Calvin 2)

- Because Calvin is the last born, in his culture (i.e. Venda culture), a man who is born last in the family should remain in it and be able to provide and improve the homestead

- It helped Calvin to gain respect and be noticed in the village which for him played a very important role to have a distinct identity in the community he grew up in, as he said:

  > When you are in the village, at home, you look different from other people … because you wear differently … so women or ladies start to look at you differently (Calvin 2)

- It helped Calvin to have influence in establishing new projects that could help his community

  > Because there is no access to information on how they can get funding … it is a big problem … so that is why there is a need for people like us who are informed to tell them about this information (Calvin 2)

- MacD felt his life was at the stage of spiritual fulfilment when he said:

  > It took me out of that dark hole of my life and has put me in this... [bright and better future] (MacD 2)

- There was hope that with the training and skills acquired they will be able to find jobs (Tso 1)
- The GS changed their interpersonal characters e.g. from being shy to being sociable.

5.7.3. Future plans in Groen Sebenza or the Biodiversity Sector

As mentioned above in section 2.11 on Culture, it was not only through the mode of engagement that the newcomers developed a sense of belonging but also through the mode of imagination (Wenger, ibid). Thus the incubants' imaginations about either participating in the institution, GS or GIS CoP in general were as follows:

MacD and Calvin were confident to take up bigger responsibilities in proper jobs and did not want to see themselves staying in the GS project for much longer. They wanted to assume jobs in different institutions. Their reasons for leaving the project differed.

One of the reasons they wanted to leave the project was that they believed that they have acquired 'sufficient' skills to be prepared to take-up new responsibilities and that they

wanted GS to put someone else in their place so they too could receive work experience similar to theirs. MacD said that:

> I would like to leave them in peace by getting a new job somewhere else … and they must keep helping other people when I'm gone … because they have done a lot for me ... I'm positive now that I have the experience (that I aspired to gain) ... they did something great for me … I am now having confidence that I can face any vacancy interview at any time … I'm now fit to join other institutions, like government, private sector, etc.(MacD 2).

Another reason was that their roles are no longer stimulating or exciting. Calvin said:

> Honestly speaking I can't wait to get out of here … this place is tiring and boring … and [there are] no challenges … I want something new, something exciting (Calvin 2).

On the other hand, both Tumi and Tso felt that they still needed more training to sharpen their skills and knowledge and competencies, thus they needed to complete the whole 2.5 years to be ready for new responsibilities.

All of the incubants were considering enhancing their qualifications and specialising in GIS, and MacD and Calvin wanted to continue to register with PLATO.

5.8. CHALLENGES AND SUCCESSES FACED BY BOTH INCUBANTS AND MENTORS IN THEIR CoP'S/INSTITUTIONS

The context makes every CoP (and its members) unique. It is through the challenges that the CoP's succeed. And the challenges of the CoP affect its members differently. Here I separated the challenges and successes of incubants from the mentors. I did so with the understanding that every member has a role to play in a CoP and to see the constraints and enablers of those roles.

5.8.1. Incubants' challenges

These challenges did not apply to all of the incubants as each of them is unique. I highlight the important challenges that the newcomers/incubants faced in their organizations.

The incubants from SANBI and LEDET did not have specialised GIS mentors or GIS mentors who were recognised by PLATO. This was a barrier for incubants who wanted to be recognised as GIS specialists or technicians with PLATO. Even though the incubants from ESRI did not mention whether their mentors were registered or not, it was evident that all the incubants were subjected to acquiring the GIS knowledge that is only applicable to the organization but not necessary the in-depth and extensive principles of GIS in general (refer to table 13 and table 14). This might prove to be a disadvantage in the GIS market. For instance the incubants from ESRI only used ESRI-GIS packages, from SANBI they used ARC-GIS from ESRI and incubants from LEDET only used partially ARC-GIS from ESRI and partially open source software.

The incubants from LEDET were given mentors who did not have time to sit with them, mentors who were always occupied with their own work because they assumed bigger roles in the organization. There was also insufficient working equipment, workstations and a large number of incubants had to share equipment which then counteracted their completion of tasks. Again they did not have a budget to do their tasks, as a consequence it became difficult to plan anything requiring a budget e.g. field trips and training courses, which were important for their work and development. So in many cases they had to compromise. These demotivated the incubants and led to them creating their own assumptions about the organization's culture and coordination. They became doubtful that what they did would lead to a meaningful trajectory career wise and they started to interrogate their identity and sense of belonging in the organization.

The incubants from ESRI/DEA and LEDET feared they might not learn as much as they wanted to or was required of them or the training might not equip them with the qualities required in the GIS field in general.

At LEDET, there was poor communication between the mentors and incubants, between the mentors and the department, between the department and the GS project organisers in

terms of the budget, incubants appointments, what was expected from incubants and what was expected from training provided by hosting institutions, and bursary issues were not clearly laid out, which resulted in incubants being unsure of their future and standing in the organization, and sometimes they could not make informed decisions. In terms of the bursary issue it seemed the problem lay with ESRI and LEDET because, for instance Tso and Tumi wanted to study for an Honours degree but only if they received a GS bursary, however because they did not know the details of how the process worked they could not decide whether to register or not. Nonetheless Tumi did register regardless of the situation hoping that she could save enough money from her stipend and that a GS bursary would become available.

The incubants from LEDET felt that many of the challenges discussed during the induction training were not addressed by the GS organisers and/or LEDET who were slow to respond to them.

The incubants from SANBI and LEDET (Calvin) felt the stipend was not enough as, although in the beginning of the project the stipend was sufficient, the cost of living escalated.

The incubants who were in the GIS entrepreneurship programme (i.e. ESRI/DEA), said it would be difficult for them to start a business in the environmental sector because “you have to be very educated and have a lot of experience" (Tso 1 and Lebo 1), also “because I don’t think people will have confidence in me …l like to do consultant work, it’s too soon” (Tso 1). So the incubants from ESRI/DEA felt that the GS 2.5 year training would only equip them with enough expertise to find a job but not to start a business. Again Tso felt that the skills program or plans from ESRI does not really match with that of DEA as she said:

> Actually leaving ESRI was suggested by us to our bosses … because we said we have been taught at different directions here … we have a lot of work at DEA and lot of work at ESRI … so we might as well focus on one thing … because the purpose of us going to ESRI was to get GIS training …s o now we did all the training so really there is no use of us being there (Tso 2).

The most profound finding was that the incubants from ESRI/DEA and LEDET feared not finding jobs after the completion of the GS internship.

5.8.2. Mentors' challenges

Mentors from LEDET had little time for mentoring, as it was not included in the job description and was be done outside of the mentors' APP, thus it was not as effective as they would have wanted. The mentors from ESRI's challenge was that they did not understand the entrepreneurial programme that the incubants had to go through especially when in some cases the incubants would be taken away from ESRI for a week to learn other skills from other organizations. As a result this diverged them from ESRI's schedule. As Sofia said:

> I am already getting a little agitated for these weeks that they go away … because in that week they absolutely learn nothing … I still want to understand how do you take a person with a physics degree and you make her learn and grow GIS, because if you have physics then you have to learn in physics field (Sofia 1).

The mentors felt that they needed more time practicing GIS skills rather than attending courses. This indicated miscommunication between the DEA and ESRI about the expectations of the training, it also showed that the training program was not clearly discussed with ESRI. The probable assumption is that the DEA had confidence in ESRI because ESRI is a reputable institution in GIS globally.

Mentors from all organizations felt that there was a lot of GS administration work needed from them which they did not have time for. Even though GS provided the mentors with mentor engagement workshops, the mentors felt that they did not have time to attend all of them even when they saw that they were good for their own development.

A mentor from SANBI, Thoko, felt that the incubants needed regular supervision because sometimes it was difficult for her to manage the incubants because they still had "a school

mentality [attitude]". The incubants lost direction or they would drag their feet. Because of that "getting interns to learn how things work in a real working world could be challenging due to those adjustments [power dynamics of University and workplace, etc.]" (Thoko 1).

Mentoring was challenging because first and foremost the mentors did not get the support they needed, also "maybe if mentors can be compensated for mentoring, maybe that will make them stay and maybe they will take interns seriously … I don't know just maybe" (Thoko 2). And because the efforts of mentoring were not rewarded at the same time 'they just have to do it' (Sofia 1), it detracted from their normal work (Treve 1). Furthermore the mentors from LEDET felt that their mentoring efforts were deficient, plus the mandate of the department kept on increasing and so they neglected their mentoring efforts. Also because the mentoring efforts were not included in their job description, the mentors were losing focus and getting stressed by their own work (Treve 1).

Lack of or broken communication between mentors and the department/institution (i.e. LEDET) led to the mentors not knowing "between what's wanting to happen and actually effecting it" (Treve 1). The generic approach used for every incubant, in terms of how the budget should be used, was not working well for the mentors since each incubant required different needs. Also the performance evaluation system that was provided by GS was not working for them either.

There was no capacity for mentoring at LEDET, a problem that has existed for many years especially in the GIS unit (Kevin 1). Hence those who were available could not tie the incubants down to specific deliverables rather they were given very broad deliverables. In addition mentors from LEDET were not prepared in advance that they were going to be mentors as Kevin said "they didn't tell us that you [the incubant] are coming" (Kevin 1) and as a result their planning was fragmented. Though they "were consulted" (Kevin 1) but with no clear procedures, initially they "were asked what do we [mentors] need?... And we said this is what we can use … but take note that there are no mentors so if you want to bring these people [the incubants] in then you have to appoint mentors for them" (Kevin 1). Their needs were still neglected and because there were no clear procedures explained to the mentors and other members of the department, the incubants received slow and insufficient support from the institution's IT, HR, etc. which as a consequence made it

difficult for optimal mentoring (Kevin 1). It took a while for the incubants to get assimilated into LEDET system before the contracts (signing off of 'service-level agreement') were signed. As Kevin said:

> First of all it was a challenge to find them a place to sit … because they [LEDET] didn't provide any office for them …t hey called us and said come and collect these people … so we had to sort out workspaces for them to sit … then we have to work out find computers to work on … first of all we needed to get them access to things like email, access cards to get inside the door otherwise they had to sign like a visitor every day … and that took a lot of time (Kevin 1).

Overall, the LEDET experienced more problems with the GS project than the other organizations which I would have thought would have delayed the incubants' developmental progress which it did. However data shows that the incubants from ESRI even though they started off well, in the middle of the program they felt little need to invest effort at ESRI because they had already selected the qualities they needed for their pursuits in business. They were either already beginning to see their trajectory of GIS business in the landscape of GIS knowledge provided by both ESRI and DEA or they were bombarded with so much information that they could not handle it. Nonetheless, though the beginning period for the incubants differed what was important was to see whether within twelve months of training, i.e. for this study (or 2.5 years for the project), they were going to produce satisfactory outcomes to prepare them or qualify them as full participants.

5.8.3. Incubants' successes

The general understanding of success was that it was about achievement of something desired or aspired to and that something was 'what mattered the most at that time' in different areas of the lives of incubants, personally or professionally. MacD said that his success so far was that he was "happy", he had "freedom" to do whatever he wanted to do with his life and he was "financially independent" from his family (MacD 2).

Tumi's success was about mastering the occupation, and receiving working equipment after almost a year which made her hopeful about the future in the GS project. Calvin said his

success was 'receiving a stipend every month' and being "thankful every day that at least he was not sitting at home" (Calvin 1).

Tso shared the same feelings with MacD about being happy, and Tumi about refining her mastery of the occupation and the tremendous training and skills that have been imparted to her made her confident and to anticipate a better future in GS. Lebo and Mosidi's successes were that they were receiving exposure in both the GIS field and business.

5.8.4. Mentors' successes (also applicable to GS Internship Project's successes)

The mentor from SANBI felt that her incubant was productive because he had the advantage of receiving training from the NRF annual internship, although it was limited to a 12 month period, before the GS project.. But now that he was in GS project he was able to complete his project and was able to 'own' or be accountable for it e.g. publish it, get reviews, etc. As Thoko said:

> The project he presented for Wetland Indaba because he had finalised collecting the whole data for the country … but that was part of his work while he was still NRF intern …s o the nice thing was that he did not leave, he got to finalise his project and making it [publish] available on the SANBI GIS website and presenting about it … I must say it was a nice highlight … he also got to be interviewed about it (Thoko 1).

The fact that her incubant got the chance to polish his skills due to having had prior training did not only benefit the incubant but also the mentor received good returns from her investment of energy and efforts, i.e. skills transfer to the incubant. And that encouraged the mentor to plan meaningful activities for the incubant which helped the incubant to identify with the community or team and imparted a sense of making a meaningful contribution to the knowledge in the community. This was supported by Thoko when she said:

> The success I could think of … is the NRF internship time was not enough … 12 months … with GS you are able to apply yourself and invest more energy to an incubant … because you have an opportunity to do a longer project … more meaningful skills transfer … we don't want to invest so much energy to someone you know s/he will leave soon … and

> the following year going to start again … since the program has started there were projects where we knew we can take extra hand because we know we can rely on that extra hand (Thoko 1).

Again at SANBI, the presence of a few GIS incubants in their unit has helped the GIS masters to go back to the drawing board and to be reminded of the basic qualities required in the GIS field. Those are; (1) reviving the paths for access to relevant information for newcomers as many of the GIS mentors are autonomous and they already know where and who to consult for information (2) opening paths for continuous and effective communication for when the incubants need advice (3) creating a platform for discussing issues and (4) for the GIS mentors to be readily accessible and share the role of supervision just in case the immediate mentor is not available. To improve the GIS practice in SANBI they hoped to establish an online/intranet GIS community forum. This was supported by Thoko who said:

> At SANBI we started to have a GIS forum for SANBI employees, and we have four GIS incubants (which may work better) …. to try to develop the practice within the organization … we are starting things like an online server where we can all connect and retrieve data … so those kind of things were no longer really there (existed) … like some of us have been in SANBI for 5 years where we know who to call if we need particular data … so now we are back to basics, back to the drawing board … and are trying to make sure that they [the incubants] know where things are… all GIS incubants are based in Kirstenbosch except MacD who is based here in Pretoria (Thoko 1).

Since the incubant has been working with GIS community for a longer time at SANBI (i.e. experience of one year from NRF internship plus GS project), they were gaining confidence with the competencies of the incubant to supervise and envisaging entrusting him with new interns whom they expect every year from NRF. Thoko said:

> At times they know if they [the GIS community] can't get hold of me they can get GIS support from MacD … and that shows a certain confidence rating … and he can even assist with administration things … I don't always have to be physically there … (Thoko 1). You don't need to start a new intern now and again … or instance now when we get the intern from NRF (12 months internship), MacD will be the one who will work more closely with that intern without me needing to be there because of the investment of having spent so much time with him (Thoko 2).

The other success mentioned by the mentors was that the incubants, specifically those from ESRI and LEDET, were taking their careers further by enhancing their academic qualifications, i.e. registering for an Honours degree, and they wanted to register with a

recognised and accredited body, PLATO, so that they too can be recognised GIS practitioners. MacD from SANBI also wanted to register with PLATO.

For the mentors in LEDET, their success was that they received the work equipment which they had been waiting for and as a result it will make their mentoring task easier. Moreover they will have a variety of exposure for incubants which will enable the incubants to identify with the trajectory they want in GIS, as Treve said:

> Having said that we got a server yesterday which we were waiting for it since forever… and I finally have a server … and we have 4 high performance computers … o now we have option (Treve 2).

Even though the incubants at ESRI did not have an academic background in GIS, they had the potential to grow and be better candidates in GIS.

> I interviewed them and then I liked them … I saw the potential … that was primary … I still want to understand how you take a person with a physics degree and you make her learn and grow in GIS … and I have got another lady who did geology … I needed to teach her GIS …a nd another one who has a little bit of remote sensing … I need to give her [them] the exposure to attend all the GIS courses … I mean I saw the potential and how can you judge potential … I thought of the potential (Sofia 1).

5.9. BROADER PERSPECTIVE ON THE GS INTERNSHIP PROCESS, LEARNING AND TRAINING

5.9.1. Mentors' views on the differences of the Groen Sebenza internship from any other internship

The GS internship project was different from any other internship because of the following reasons.

It benefitted the mentors because: -

Although most participants, specifically mentors from LEDET and SANBI, and all incubants found the GS project as a "great initiative", however the mentor from ESRI did not see GS as different from any other internship programme. So it was not necessary for them to treat the incubants differently from the usual interns they receive from other internship programme because they have a standard training program for their newcomers. Whether that benefitted the incubants in their pursuit of becoming better GIS entrepreneurs or drive the GS agenda, I can only claim that the program was adequate to acquire GIS skills which however did make them reliant on ESRI products. As SANBI and LEDET (and my experience at the University of Witwatersrand) are using ESRI GIS packages, the incubants have an advantage of finding a job but not enough for them to start their own business outside of ESRI's products. Sofia said this about GS not being different from other internship programmes:

> It [GS] is nothing different from what we have been giving to other interns … we still treat the GS interns the same … we put them in our training programme … but please do not call it incubation … what's that? (Sofia 1).

Another benefit was that the mentors from LEDET and ESRI were able to include the incubants in their normal work programs, were able to screen their ideas, able to expose them to different projects, and involve them in meaningful projects like strategy planning and team meetings, as Thoko said:

> We try and be very much inclusive of them in our work programs, checking their ideas, exposing them into different projects, including them in things like strategies planning and team meetings … so they get more responsibilities than what you would get if you were still an intern (Thoko 1).

Also they were exposed to regional and local biodiversity matters as Treve said:

> And they are also going to develop EnMP (Energy Management Plan) for that area …s o I'm trying to slot her into that … so that she picks up on these big regional planning issues … and get her into something that is relevant to conservation … that can be biodiversity context, or conservation planning … I have taken them from my work plan as well … so we have got biodiversity special planning where they will normally come in … biodiversity assessment and scientific reviews … and the way we set our work plan is

> just to provide assistance on request … and I kept it vague so that they can have a scope as well for instance to have an option for River health monitoring project(Treve 1).

The mentors from LEDET and SANBI were hopeful that the skills they were imparting to the incubants were not going to be in vain because they were able to witness the incubant's developmental stages during training. As the training lasts for 2.5 years, they can invest more energy and the interns are able to apply what they have been trained for. Treve said:

> The difference that I have seen between SANBI and us is that for the guys [interns] don't get enough training, we train them up to the level where they just getting productive and then they are released … and the SANBI one we are getting a proper production (Treve 2).

And Thoko said:

> I think he has been fine and he is learning … he is growing his skills by serving on the internet to understand the tools in GIS without me telling him what tools to use … the NRF internship time was not enough … 12 months … with GS you are able to apply yourself and invest more energy to an incubant … because you have an opportunity to do a longer project … [there is] more meaningful skills transfer (Thoko 1).

The mentor and incubant are able to "make plans for the next year before they get there" (Treve 1) [i.e. they can plan in advance] and it worked really well for them. This was supported by Treve from LEDET when he said:

> I wanted Calvin to go but it looks like it is not happening,… but I think the contract ends after the next forum …s o I will make Calvin go next year and give him the opportunity Treve 2).

Thoko from SANBI said:

> This thing of it [GS] being a longer period is also nice … yes it doesn't guarantee that the person will stick for the whole 2.5 years because they could get a job at any time … but the fact that we [mentors] know that the interns are with you for a long run … and you don't need to start a new intern now and again … taking for instance things like presentations … and all that … I don't have to cover his questions [now]… he is able to answer and handle his Question and Answer sessions … hence I think skills are being transferred (Thoko 2).

The ‘extra hand’ which is the incubant, at SANBI, has increased the labour-force in their GIS projects and has relieved them from some of the responsibilities. It did not only relieve them but also seeing the incubant’s competencies grow gave them pride as a community and confidence to let go of the incubant. This was supported by Thoko when she said:

> Having extra hands, having someone that you can delegate and they can be there without you being there and being able to deliver is a nice thing … and seeing your intern being able to present in front of different audiences on his own gives you [mentor] a good feeling … he went away with my colleague, John, the other time to the ecological infrastructure meeting … the only thing we did before his departure was doing the briefing on how to do maps for Tshwane and other stuff… and regarding the feedback I got from him … and it was nice (Thoko 2).

It benefitted the incubants because: -

The incubants were able to be entrusted with meaningful responsibility. After a while (± 10 months) in the GS project, they were given little supervision and less instructions from the mentor and so they were able to develop independence and confidence skills.

> There is more trust than before … she is trusting me and the work I do … I am also showing her that I am doing my work very well …that is why she trusts me … as a result I have lots of freedom … so I do my work alone (MacD 2). And Tumi said:

> For us right now Calvin and I ... we are sort of on our own … we are teaching ourselves … yah … I wouldn’t say that need has been met … I think it’s just one of those things … that we are on own basically … he is guiding us here and there but he is not an expert in this field (Tumi 2).

> Also Lebo said “I’m quite positive that I want to start my own business and do my own thing … and DEA is helping me do that” (Lebo 2).

Though they are gaining independence skills, those skills are not influenced by the same situation, hence they could produce different outcomes. For instance MacD’s feeling of becoming independent was influenced by the support and resources he received from his team, and Lebo’s was from being able to see the potential of where her skills she gained and continue to gain from both ESRI and DEA are taking her, and Tumi’s are influenced by the fact that she does not have a choice since they have limited resources. MacD was able to

take ownership and control of the project from the beginning until the end because of the length of time he had spent with the GIS team.

Most incubants, specifically from LEDET and SANBI (also the mentors affirmed), felt that they understood some of the things expected from them already, even though they were fresh from the university, what they needed was to be “channelled to the right places" (Treve 1). Also Thoko, the mentor said that the idea of them making mistakes is inevitable but the advantage of being in the GS training is that they will get a chance to rectify them. Lastly the incubants could walk into the GS project with a basic BSc degree and walk out with a Master’s degree (Treve 1).

GS approaches were beneficial because: -

GS has taken the approach of a learner-based curriculum kind of training i.e. all learning was driven by the learner’s urgency, and the system used to explain the job description and performance evaluation was slightly different from the SANBI’s system and even the NRF’s (Thoko 1).

> So I think … my understanding of the project is to fill in that gap by providing us with training, so we can become knowledgeable in that field so that you learn and able to work and be empowered as an individual (Tumi 1).

> They are trying to make us marketable … so we can be employable in the future (Calvin 1).

The approach of trying to engage the mentors and having feedback sessions so that they could learn from each other was found by Thoko from SANBI to be a good one and demonstrated that there was learning happening, as Thoko said:

> Another different thing is the whole thing of trying to engage the mentors and having feedback sessions so we can learn from each other … those are the things we do differently where in some cases it's just you and your manager, you do management planning from PDP or etc. ... but other than that there is nothing so informative or engaging that has been happening …s o GS has taken a different role of really trying to be engaging (Thoko 1).

However, Kevin, the manager from LEDET, stated that it seems that the approach works well especially for the mentors from small organizations or the organizations that appointed fewer incubants, as he said:

> That's what I picked up from the mentor engagement workshop … remember at that workshop they bring all different organizations from Limpopo who are host organizations … SANParks, WWF, Wildlife and Environment Society were here and few NGO's … but what I could hear during these engagements it seems like the programme is more successful and effective in small organization … they are just small organizations and will have 3 or 2 interns …f or them it's easy and it works effectively (Kevin 2).

This could mean that the GS project started off by giving more attention to organizations where the project works or has fewer challenges. This could explain why MacD from SANBI developed most of the GIS skills earlier than other incubants.

The longer period of the GS project was conducive for the incubants and enabled a more meaningful skills transfer.

> If you sit in a normal one year internship … in our department it coincide with our financial year so they [interns] come in on the 1st of April, the end of procurement term … our budget starts in May and we only procure in June … it means you have lost 2.5 months … and we also have internal academics so the idea of trying to make interns do post-graduate studies is thrown out of the window … because you can't make those arrangement … so that leaves you with six months at end of the year… and with GS you can make plans for the next year before you get there… and that, for me works really well (Treve 1).

> The success I could think of… is the NRF internship time was not enough … 12 months … with GS you are able to apply yourself and invest more energy to an incubant … because you have an opportunity to do a longer project … more meaningful skills transfer (Thoko 1).

Treve further mentioned that the incubants from GS were of "a better quality than we have from our internal internship programme" and "better qualified and more keen". That is why the mentor felt that they could make a difference in the lives of incubants, and there was

potential to make the alignment between the incubants' career paths and the organization's mandate.

One year internships are flawed because: -

According to Treve's point of view, the mentor from LEDET, a one year internship, especially the time at which the interns are being appointed, does not give them time to arrange or plan activities that will make a meaningful contribution to the intern's career trajectory (refer to Treve's view above about the difference between their departmental annual internship and the GS internship). He further mentioned that the one year interns do not get enough training, they get trained up to the level where they are about to be productive and then they are released but with GS incubants it is different.

Another disadvantage was that the institutions invest a lot of money in the one year internships but after their completion, half of the interns "are sitting around in the Limpopo [villages and corners]" (Kevin 1) not doing anything. Also MacD said:

> They [SANBI GIS team] welcomed me very well from the beginning … and when my contract for NRF ended … and I joined the GS project … hey were happy that I am back and were worried about the contract that ended and left me nowhere (MacD 1).

This demonstrated that there is a concern about follow-up assessments that need to be conducted on the future of the interns after the completion of the internship training. If this information is not available then the impact of internship training on the graduate employment or the link between the internship training for disadvantaged graduates leading to a better job especially in the biodiversity sector cannot be tracked.

Last but not least, the mentors do not want to invest so much energy into interns who will leave the following year because retraining new interns from scratch consumes a lot of effort, both cognitive and physical for mentors to effectively train newcomers. Of course

there are assumptions that the interns will end up getting better jobs but how that will happen or what guarantees that movement is not well addressed and explained.

5.9.2. RECOMMENDATIONS ON HOW THE GROEN SEBENZA INTERNSHIP CAN BE IMPROVED

5.9.2.1. Incubants' recommendations

Though the GS project was able to give matriculants and graduates opportunities to skill themselves in the biodiversity sector, the incubants from the study felt that the publicity of GS did not penetrate the remote rural areas, because some of their friends still did not know about it. Should the GS project proceed to the next cycle they felt GS should appoint someone who specialises in advertising and marketing so that it can spread to all corners of South Africa and be accessible to the youth in rural areas. They felt there was a need to write stories about GS incubants to inspire the youth and the incubants from other institutions.

The incubants from SANBI and LEDET felt that even though they were receiving training provided by the organizations, it was not enough; they needed more training courses to strengthen the skills they acquired from the organization. As Tumi said:

> Another thing is that GIS is practical … so you need working resources to practice and know more … also it wouldn't kill for SANBI to organise short course because surely at the end of this 2.5 years we will have more knowledge (Tumi 1).

And Calvin:

> We have not gone on any short courses but I see the possibility of going to training this year [2014]… (Calvin 2). First of all ... they must provide one with resources ... they have to take us to training … training is very important because there is a lot we don't know (Calvin 1).

And MacD said:

> [I need] Lots of training … that's what can this GS project can do for me … a lot in the environmental side … different divisions under environment especially those that are related to what I am currently doing … (MacD 1). Attending more training sessions (MacD 2).

The incubants from LEDET and ESRI also felt that they needed more time, especially at the beginning of the project, so that they could improve their GIS skills as Tso from ESRI said "I just need more time … just more time … yah I think I will get better with time".

The incubants from LEDET felt that "it would be great to have a real GIS technician as a mentor … somebody who knows the ins and outs of the GIS fields …" (Tumi 1) and "but it is going to be tough here because my mentor doesn't specialise in GIS but he is very good in GIS … and at PLATO they want a mentor who is a professional (GIS practitioner)" (Calvin 1).

Another issue was to make the working resources available so the incubants could practice GIS skills. They felt if they had more practical work in GIS they could do the actual tasks and enhance their knowledge. Though the incubants from LEDET acknowledged the GS project as a good initiative they still felt it was not well implemented and not well communicated especially from their side as Tumi said:

> Well I think the initiative was a great idea … but the implementation is not proper … these things [challenges] shouldn't be happening if it was properly planned … what we are going through now should have been avoided … I think even with the budget issue … there is always no money … all the frickin time there is no money … yet we were told that we have R60k per annum … its' almost a year now what happened to the R60k? That's the money that was supposed to help, that's the money that was supposed to provide training (Tumi, 1).

And Calvin said:

> There is poor coordination (challenges) … I think there is lack of communication between SANBI as an employer and the hosting institutions … because when I came here they (LEDET) didn't know I was coming … they (LEDET) were shocked (Calvin 1).

All incubants were hoping for their organizations to create enabling environments for them to grow so that at the end of the project they would be marketable. Because the incubants from LEDET (and from other institutions - mentioned during the induction training) were frustrated by the challenges they felt neglected and saw a need for "the GS coordinators to visit different hosting organizations … to check the progress, what's really happening" (Tumi 2). Not only did they want the coordinators to assess their development on site but also they needed to interact with them, as they had not had one-on-one interaction with them. They neither saw the GS coordinators visiting their organizations nor engaged with them, therefore they thought the coordinators were not serious or interested in seeing them progress or even ensuring that they progress, as Calvin said:

> I don't think GS organisers are doing enough to improve our abilities and appreciate our skills (Calvin1). I think they need to take us seriously (Calvin2).

Last but not least the incubants from LEDET hoped that the GS coordinators will learn from the LEDET challenges and will prevent them in future. As Calvin said:

> I think maybe it's because it was the first time for SANBI to do this kind of a project and we are the first ones to be tested in this project because it's a trial project … I think they have learnt a lot from these challenges should this project run into another cycle (Calvin 2).

5.9.2.2. Mentors' recommendations

Mentors need to be oriented and informed in advance because in some cases they did not know they would be required to do the job (LEDET and SANBI).

At LEDET the mentors felt there was need to communicate within divisions or institutions about mentoring and delegation of mentors since it was not well established for the GS project. Both SANBI and LEDET mentors felt that the incubants needed to be inducted into their organizational workplaces. Because issues can arise during the course of training and the incubants might not know who to report to as individuals, the mentor from SANBI felt that there should be monthly get-togethers involving the organization, incubants and

mentors, where issues are discussed and to see who is who in the institution so that the incubants can choose mentors or even just understand the institution. As Thoko said:

> Another thing is that there should be monthly engagements of incubants like that arrangement we had with the NRF interns … where they had tea or coffee and presentations …it's not happening with GS incubants and they don't know who [amongst themselves] is doing what … I think that also need to be changed (Thoko 1).

The incubants and mentor need to explain to each other their expectations and future plans. The incubants need sit with their mentors to map their career plans "because you [the mentor] could be busy grooming someone [the incubants] for being deep in science only to find that they are looking more into management careers" (Thoko 1).

The mentors also felt GS needed to improve the training course opportunities, so it should not create general courses for everyone as every incubant and occupation requires a different training course. The GS should develop a better training needs system that will be able to accommodate every incubant and occupation. Training courses needed to be assigned to incubants who share the same skills and qualifications so that they can all benefit from them. This was supported by Thoko when she said:

> Training opportunities … or rather what training courses can be done for the interns? I think they need to regroup them and not apply a single application for all … for instance people who have BSc computer science need not attend basic Microsoft training (that was recommended for all interns by GS) because they (BSc computer science graduates) know how it works, they are using GIS and done even a bit of programming (so there is no need)…. At the end they miss out on excel training, etc. ... But again there is no specific training that can benefit them … thus there is a need to identify those course training (occupation-specific) and able to offer them (Thoko 2).

And Treve said:

> And then we kind of have a generic approach to everybody … my feeling is to rather look at what their job requirements are… and really cater to their needs and focus on their budget (Treve 1).

Treve from LEDET felt that the GS internship should take the apprenticeship approach because jobs in government cannot be secured, if it is an apprenticeship the incubants will be guaranteed a permanent job at the completion of the internship, Treve explained it this way:

> You have got different levels … you have got the kind of entry level candidate … and there is going to create candidate post inside the organization … so they become candidate scientists but there are structured gaps that allow them to come in as candidate scientists … so for me as far as I'm concerned these interns should be brought in as candidate scientists when they are at the level where we are happy with them, maybe after a year or two year service, then they should be eligible to apply for the post above … that for me applies across the board … we could create a post in our structure that actually allows the guys to be pushed up … as soon as the guys (interns) are promoted out of that it allows another gap to be opened and next year we appoint again … then you going to invest in the internship process but it's…ones you are appointed you are already selected as staff (Treve 1).

Kevin from LEDET and Sofia from ESRI pointed out that for the GS internship programme to work efficiently in the future they should select students who are from relevant backgrounds to the occupations they are appointed for. Kevin said:

> The other thing that we challenges with is that … you know for yourself that different universities in our country specialise in different things … like for instance, if you need someone who is good with mammals you will get him in the University of Pretoria, someone in conservation planning will probably find him from UPE or Cape Town, Botany you find him in the University of Limpopo, or fish is in University of Johannesburg … but we were told that we can only appoint from University of Limpopo or UniVenda because they need to be local …. so I had to appoint these people from these two universities as ecologists ... then in the interviews they have degrees, and they can't distinguish between the impala and kudu … they don't know what's the difference, they don't know the animals …t hey don't know the birds … because they have not been trained as ecologists … they have Environmental degrees which is different from wildlife management degrees … and that's the challenge we have … suddenly you get people who are not really suitably qualified for what you appoint them for because the system says you can only use the people from these two universities … and now you sit with them … you send them out to the field to do the veld assessment, they can't identify the grasses … so how can you use them … if they don't have someone to mentor or train them how are they going to get those skills … so it's not the question of something wrong with the students … hey are willing and enthusiastic … but if they don't get the right training they can't do it … like for instance if you have a car driving licence and I give you a truck to drive, you won't be able to drive it because your background does not allow you … I think that's what the people need to realise is that all Universities don't produce the same kinds of students (Kevin 1).

Sofia from ESRI was faced by the same challenge as she said

> I still want to understand how do you take a person with a physics degree and you make her learn and grow in GIS, because if you have physics then you have to learn in physics field … am I wrong?... otherwise … what else? ... And also finding good candidates … but please remember I am taking on … I'm taking on a lady with physics … what does she know about GIS? (Sofia 1).

Kevin further mentioned that to better the reception of the incubants at LEDET different departments within LEDET have to work together. As he said:

> If I was the head of this organization and I signed an agreement to participate in a project like this … The first thing I would have done was to call for a meeting … get all the sections together … HR, Corporate services, IT, everybody … and assign everyone to get ready and prepare for the students when they arrive … for example … HR – sort out their office and issue of getting them into the departmental system, IT – get the computer stations ready, … so that when they arrive everything is done for them …(that would have been a good reception for them) (Kevin 1).

5.9.3. STORIES ABOUT GS INTERNSHIP IN OTHER DEPARTMENTS OR INSTITUTIONS

Wenger (1998a) stated that the development of a shared repertoire in CoP constitutes among other factors the stories. These stories can be positive or negative, but from them the newcomers will always learn a lesson. These stories allow members to build up the meaning that incubants develop in the CoP and enable them to identify where they sit through making reference to their own conditions or to others in the whole project. Members are also able to take up or discard the moral of the stories in order to use them to stay encouraged or not. The stories also help the incubants to see how, as individuals, they form part of the bigger picture.

For instance there were stories about how other incubants in other departments or institutions were frustrated about their mentors resigning and the implications for the incubants' working conditions.

Again there were stories about the activities occurring outside of the CoP that made the incubants feel relieved about their conditions, for instance the stories about the

department's one-year intern who had a bad experience with his mentor, his mentor was not a specialist in his field and so he ended up not enjoying the internship, also on his arrival at the department the mentor did not know that he was appointed as an intern.

There was another story narrated by Dr. Tanya Abrahamse about one host-institution (which she kept anonymous) that ill-treated the incubants to such an extent that the Groen Sebenza organizers had to relocate the incubants to another host-institution. That host-institution was then penalised. The allegation of the institutions' misconduct was racial-discrimination against the incubants.

Despite the stories about challenges or flaws about the GS project, there were many success stories told. Stories about incubants who were flourishing in their organizations and showing satisfying progress due to the encouragements they were receiving from their institutions and CoP, also due to their determination. For instance I analysed a booklet which was a compilation of lessons from the para-ecologists based in the Eastern Cape at Rhodes University, also stories told by the incubants from WESSA, in all stories the incubants were encouraged to perform meaningful tasks. Furthermore during the National Induction Training the incubant, Mpendulo Gabayi at SANBI – Kirstenbosch gardens supervised by Monique Mcquillan shared his success stories. He said the reason his experience was a success was because he and his supervisor discussed his expected activities, responsibilities and projects in advance; which were informed by his aspirations for his career development, as such they were able to plan the year' activities together and harmoniously. And because he had clear targets and a schedule he could perform many tasks independently.

Highlights of the chapter: The themes have covered the successes and challenges (or constraints and enablers) of the training and the project itself and other stakeholders involved, and each challenge or success has affected individuals differently. It was clear that every level of the hierarchical organizational structure needs to be supportive for effective training. Thus the themes discussed had a non-linear feedback mechanism, whereby one level needed the other to prevail, and vice versa.

Also importantly we have seen how the training has contributed to or affected not only the professional development of the incubants but also their personal development. Moreover we saw how their personal development affected their families, the identity they formed in their CoPs and social communities, etc.

All in all the themes have demonstrated the need for each stakeholder mentioned above to be reflexive about their behaviours and to make critical changes so the internship training becomes effective and useful for everyone.

Lastly, the theme – stories about Groen Sebenza – has highlighted a crucial point which I intended not to discuss but make a final remark about (in the conclusion section – Chapter 7). The point concerns the accusations about the racial discrimination in the treatment of the incubants by one of the host institutions. I chose not to discuss this because it was not directly talked about by the incubants in this study, and it might contradict the ethical processes that the participants and I agreed upon.

CHAPTER 6: DISCUSSION AND RECOMMENDATIONS

6. Introduction

As much as I am tempted to discuss every aspect or theme of the data presented in this study separately, it was not possible as they feed into each other. However I have discussed them in a manner that the reader would understand. Thus this chapter looks at three main areas.

- Firstly, it looked at the evidence presented in Chapter 4 and 5, and discusses how far (within the twelve months of the training and project investigated) the Groen Sebenza training has contributed to the preparation of full participation of the GIS newcomers/incubants as far as the GIS competencies (mentioned in Chapter 1) and Wenger's (1998b) model of the Stages of Development are concerned. Accordingly,
- It deliberated the findings drawn from this study's evidence demonstrating how people or frameworks in different levels of the hierarchical organisational structure can be assisted or can assist in developing and shaping the participation of the newcomers in their communities of practices in order for them to become full participants.
- Finally, based on the evidence provided by the data from this study, it suggested a method/framework which can be useful for the stakeholders [who play a vital role in the development of newcomers' environmental careers] to improve the internship programmes in the environmental sector.

6.1. How far (within twelve months of the project) has the Groen Sebenza training contributed to the preparation of full participation of the GIS newcomers/incubants as far as the GIS competencies (mentioned in Chapter 1) and Wenger's (1998b) model of Stages of Development are concerned.

Many participants including mentors and managers have agreed that the Groen Sebenza project was a good initiative for the transformation of the South African biodiversity sector however it has also noted that it can only do so much. Drawing on insights gained into the incubants and mentors challenges reported in section 5, it was obvious that Groen Sebenza training had its own flaws but at the same time it had great successes, for instance the mentors mentioned it was one of its kind. Its benefits were said to be noticeable and more meaningful than other internship programmes specifically those that only last for 12 months or less.

Furthermore the data revealed that each success and each challenge affected and benefitted the individuals, the institutions, Groen Sebenza itself and the biodiversity sector differently (refer to the table below). The lesson learnt through the strides of the Groen Sebenza training was that the GS project created the opportunity for the institutions (and members) in the biodiversity sector to use the networks it established, for example the mentors' workshops, in a hope that the institutions and members would adopt its initiatives or even better to expand the network and the idea. In addition, the study has provided a nuanced perspective for the institutions or decision makers to reflect on progress being made in the Groen Sebenza as well as to reflexively extend the intervention to ensure sustainable and enabling conditions for the newcomers, particularly the University graduates, so that they too can benefit from the green economy.

Table 14: Summary of benefits and challenges of Groen Sebenza training with a focus on training attended and received, a focus on training and support still needed and with how each is contributes to the biodiversity work and mandate. The GIS training courses needed were drawn from the initial needs identification form (refer section 4.2.3.1).

Institution & intern		Benefits for intern	Challenges for intern	Mentor's challenges	General organization benefits
SANBI	**MacD**	He acquired the standard ArcGIS completion certificate accredited by SAQA. His presentation skills have improved. He is happy, confident and he has freedom especially that of financial independence, and he is being exposed to many aspects of GIS	Too few GIS training courses attended hence he needed more in using different forms of metadata, Groundtruthing, georeferenced, Microsoft access, database management and communication. Also not finding a proper permanent job after the completion of GS.	Time for regular supervision	There is an extra hand, i.e. the incubant, which they can entrust some of their projects' activities with.
LEDET	**Tumi**	Exposure to the use of ArcGIS and open source software, Quantum GIS. Exposure to the use of the programming language R has revived her passion for programming.	If things continued so slowly, she might not acquire what she hoped for, especially her growth in the GIS field. Also not finding a job after the completion of GS. She needed more GIS training courses in spatial analysis, and programming.	Time for meaningful mentoring.	If one of the incubants is well trained and becomes indispensable, they might consider appointing them to a permanent post. She was providing assistance to the biodiversity planning projects and permits applications.

	Calvin	At least he was receiving a stipend every month and was not sitting at home doing nothing, as he said. He also gained social identity as a man.	Things progressed too slowly otherwise so could not wait to leave the organization. He needed more GIS training courses in spatial analysis, working with data, database management, programming and project management.	Time for meaningful mentoring.	If one of the incubants is well trained and becomes indispensable, they might consider appointing them to a permanent post. He was providing assistance to the biodiversity planning projects and permits applications.
ESRI/DEA	**Tso**	Exposure to different skills and levels of GIS. She was happy especially financially.	She was learning advanced GIS courses which she could not apply in her daily activities. Also she might not be able to open her own business as per DEA's expectation and she feared she might also not find a proper job after GS ends. She needed more time to increase her competence in GIS and business to develop. She needed more training in merging GIS and business. Also she needed GIS skills in database management, webskills, ArcView and Microsoft Access, public speaking, and	To be able to use the incubants to their optimal abilities since they did not have a proper/efficient GIS background.	She was assisting the data department with managing data.

			project management.		
	Lebo	The exposure to diverse GIS skills and knowledge, and business.	Fearing if she was going to catch up with all GIS things as she does not have a GIS background. She needed more time to absorb all the skills she was acquiring and be able to use them.	To be able to use the incubants to their optimal abilities since they did not have a proper/efficient GIS background.	She was assisting the data department with managing data.
	Mosidi	The exposure to diverse GIS skills and knowledge, and business. The opportunity to give basic GIS training to new students from different organizations.	She needed GIS training and entrepreneurial skills, project management, networking, and time management and communication skills. She also needed more time to master facilitating the GIS modules so that she can be able to teach/facilitate advanced GIS modules.	To be able to use the incubants to their optimal abilities since they did not have a proper GIS background.	She was an assistant GIS trainer.

Report on two significant findings deducted from below.

Finding 1: The twelve months period spent by the GIS incubants in the Groen Sebenza internship project was not enough to claim effective preparation of the incubants to fully participate in the GIS occupation.

This finding was to demonstrate how a 12 months training period could be limiting the effectiveness of skill transfer, the GS project duration is 2.5 years.

This finding was supported by the following evidence.

A. ***What training courses have the GIS incubants received within the first 12 months of the Groen Sebenza internship?***

The Groen Sebenza had planned that all the incubants needed to have attended at least one national training course within the first 12 months on the project plus at least one regional training course every six months of the project but unfortunately not all of the training took place as planned (refer to figure 4 in Chapter 3 about the Groen Sebenza training plan).

The only national training event that the incubants managed to attend nationally and organised by Groen Sebenza was the first phase of the project, the two National Induction Training sessions which occurred in June and December of 2013, a few months after the project had commenced. Normally the induction training in many institutions occurs before the newcomers start their work to create a welcoming environment by providing information about the norms, intentions and cultures of the practice. As reported in section 4.2.3.3 the Groen Sebenza induction training was important because it enabled newcomers to feel comfortable, understand what was expected of them and to feel included and part of the biodiversity sector. The feeling of belonging which they developed implicated involvement of emotions hence the tone used by many incubants to describe the induction

Training experience was personal (Lee, Stuart & Roth, 2003) for instance in the incubants' evaluation forms (refer to table 14) there were comments such as

> "I am grateful that SANBI brought people who care about us and share their expertise".

> "I have learned to be grateful with the little things I have because other incubants have bigger problems than I do".

> "I am happy that SANBI organizers are listening to us".

According to Wenger (1998a) he regarded a sense of belonging as the key element for developing identity, a quality that many newcomers struggle with. For that reason the benefits of the induction training goes beyond "being in the presence of others or merely of doing work together"(Lee et al., 2003) instead it challenges the newcomer to start creating meanings earlier so as they can recognize competencies that require development. The reason for introducing the induction training earlier was to avoid misinterpretation and confusion of the intentions of the institution/unit/CoP. Had the induction training been conducted in the middle or at the end of the programme (such as in the study conducted by Koyana (2014) its purpose would have been defeated because the incubants/newcomer would have already developed the identity which she might have created through her own observations and perceptions, often the identity would have become contradictory to what was anticipated of her and might require the newcomer to start afresh to negotiate a new identity. This might be too late for the newcomer to exit the programme with the required acquisition of any identity.

Though the period at which the GS induction training took place was better [and many incubants enjoyed the experience], there were mixed feelings regarding the induction training. Some incubants and mentors still felt that most of the issues addressed and discussed at the induction training were not adequately followed through (see section 5.9.1) whereas some incubants felt that there was meaningful change effected at their workplaces. This unevenness of change at different institutions or for incubants could have been caused by the systemic approach which the Groen Sebenza used to monitor and evaluate progress as the rate of change would differ for each incubant.

Going back to the issue of the planning of training courses, most of the in-house training courses that occurred were organised by host institutions based on their own initiative and with their own capital. This as reported in section 5.5.1 helped the incubants to learn skills and acquire knowledge however there is a danger that these efforts could either go to waste if the training was not applied or complement their daily tasks.

Ironically, this approach to training in workplaces is little different to the set-up of going to the University to study for a particular degree and then after completion you cannot use the qualification or the qualification was not enough to prepare you for any kind of a job, which was discussed in the case studies of the incubants in section 4.2. It is as if the same cycle repeats itself in different form in a different setting. This kind of experience has been reported in many articles about internships especially in the South African medical field (Brink, Slabbert & Barnes, 1986; Mbhele, Genis & Du Toit, 2011) in media (Lerato T. J – Editor of TrueLove Magazine, October 2012 – The intern Agenda), in sociology (Buhlungu & Metcalfe, 2001) in studies conducted by the National Youth Development Agency (Koyana, 2014). Tso from ESRI, mentioned that even though ESRI offered plenty of training at some point she felt the training was not taking her in the direction where she wanted to go or where the DEA planned for them (section 5.9.1). Another contributing factor could be that often the members/expert of the GIS CoP did not have time to attend the mentors' engagement workshops offered by GS so as a result they operated in silos.

This then affected the process of learning and the development of both the mentor and incubants; as they both needed continuous engagement with other members to share their knowledge (Wenger, 1998a). Even though they were experts and the incubants spoke well of them, since the incubants relied on them for proper development, they could have made the effort to attend the workshops for the sake of their development and that of the incubants. I say this because the teaching by a trained mentor imparts a vital sense of confidence to a newcomer.

B. How and what learning did the incubants acquire which gave rise to the qualities for GIS competence?

1. The incubants learnt many things however most of the skills contributed minimally to their development as GIS professionals. This is because the manner in which the skills were acquired, particularly the GIS specific skills and generic critical skills, was not structured or made known to them in advance, specifically the incubants from LEDET and ESRI. The skills were exposed to them occasionally that is why on the list (refer to table 14 below), they are indicated as partially acquired. Similarly to the life skills, the incubants learned them informally. The other important aspect in training is how the skills are acquired or learned because it is not only about how many skills you acquire but also how you are become competent in them. Another aspect of competence is that it grows with the amount of time you are exposed to the situation(s). However looking at it from a different perspective, it can be argued that they are being placed in a natural setting and one of the ways of giving the newcomers optimal exposure to what it entails to be a full participant, is for the mentors to share the same office as the newcomers so they are exposed to the same situations as their mentors.

   The following is the summary table of the skills the incubants acquired over twelve months.

Table 15: Summary of knowledge and skills acquired in the first year of the Groen Sebenza internship project.

Name of Organization	Incubant name*[20]	GIS specific skills	Generic critical skills	Life skills
LEDET	Tumi	Cartography and working with data, partial database management, creating geodatabase, Quantum GIS skills, partial editing and digitising images	Computer skills, and spelling and grammar, partial programming skills using R, fieldwork-herpetology activities, giving support to colleagues,	Teamwork, articulation, planning skills, listening skills, participated in the biodiversity planning forum, independence, self-motivation skills, communication skills, prioritising, confidence,
	Calvin	Cartography, database management, data assessment, partial ArcGIS software skills, creating geodatabase	Partial report writing and partial computer skills, partial programming skills using R, giving support to colleagues	Teamwork, articulation, planning skills, listening skills, financial independence, social identity, ability to support his family, communication skills
SANBI	MacD	ArcGIS software skills, creating maps, database management	Networking, oral and poster presentation skills, report writing skills, giving support to colleagues	Teamwork, planning skills, negotiating skills, organising skills, project execution, confidence, prioritising, financial independence, time management, problem solving, gained trust from mentors, spiritual fulfilment; participated in the biodiversity planning forum, wetland workshops and wetland indaba
	Tso	Partial computer skills, basic and standard ArcGIS software skills, advanced remote sensing, creating maps, cleaning data	Partial analytical skills, partial GIS entrepreneur skills, partial networking skills, giving support to colleagues	Teamwork, planning skills, negotiating skills, listening skills, partial project execution, independence, volunteering, confidence, respect for work ethics,

[20] * a symbol for pseudo-names

				eager to start a small business, participated in business workshops
ESRI/DEA	Mosidi	Partial writing skills, partial computer skills, partial GIS software skills	Partial networking skills, partial GIS entrepreneur skills, partial presenting skills	Teamwork, respect for workplace ethics, independence, partial GIS teaching skills, partial facilitating skills, participated in business workshops
	Lebo	Editing data and creating table joints, partial ArcGIS software skills	Partial GIS entrepreneur skills	Participated in business workshops

One can make the assumption that the incubants' expectations were unrealistic. The way to counter that is to discuss their expectations with them in advance.

Calvin and Tumi were learning the management of a geodatabase, and occasionally they would work together with other colleagues on projects (team-playing), demonstrating the ability to work independently even though their mentor mentioned that they lacked discipline in working independently. They had a basic understanding of GIS software, both the ArcGIS and open-source software and intend to enhance their qualifications. These are some of the qualities required for a GIS practitioner the GIS expert, Ms Terrapon, indicated.

2. The data has shown (see section 5.7.2) that in some cases the techniques that mentors used to mentor and the techniques that incubants used to learn were not compatible. This was important because the constituents of building a relationship between a mentor and a mentee depend on it being examined in order not to inhibit learning which could adversely affect the intent of the Groen Sebenza internship training.
3. Incubants not only learn workplace based skills and knowledge and competencies from the communities of practice but also learn personal skills for example managing their own finances (see section 5.8.2 and table 14).
4. One of the more noticeable aspects which affected the learning and training of incubants was that the structure of the learning curriculum or plan of activities was not explicit. As such it was difficult to evaluate the incubants progress. For much of the time some incubants were performing random activities and learning petty or irrelevant skills as reported in section 5.5.1. This could discourage the intern and make them lose interest in their work. Furthermore the internship's lifespan of 12 months which I managed to investigate did not allow for competence to fully develop.

C. Has Groen Sebenza training strengthened the learning, experience, knowledge, skills and interest of the GIS University graduate incubants?

For some incubants their training has strengthened the skills and knowledge and competences required for a GIS occupation but only at a level of personal achievement and desire such as happiness and courage – refer to table 14 (Hausman, 2007). For instance, we saw from MacD's experience that he was a confident person and felt he was ready for new challenges. This was due to the fact that he was exposed to more activities (i.e. freedom of choice, specifically resources) of GIS than the others. But as for Tso, Calvin, Tumi and Lebo they did not achieve that courage hence they still wanted to settle in the internship project because they felt that their competencies were lacking. Despite the challenges they encountered they still had an eagerness to learn and hope for the opportunity to improve.

Despite the challenges regarding their professional development, these have contributed to their becoming complete beings in their workplaces. As Amartya Sen's concept of the 'capability approach' indicated that it is not only through the doings that humans find value but also through the beings which makes them whole. Both features need to be acknowledged and nurtured especially if the intention is to develop them.

But was it enough? Using Wenger's 1998b model of emergence of participation in communities of practice (see diagram 5 below) and LPP aspects (as indicated in figure 4-summary of research design). Drawing from the incubants' experiences – both the participants and others (refer to graph 2-4; skills identity needs) and using the themes that emerged in the data, this study claims that as far the stages of development Wenger described, the incubants' participation and development only progressed to the coalescing stage. Even this stage was not fully explored.

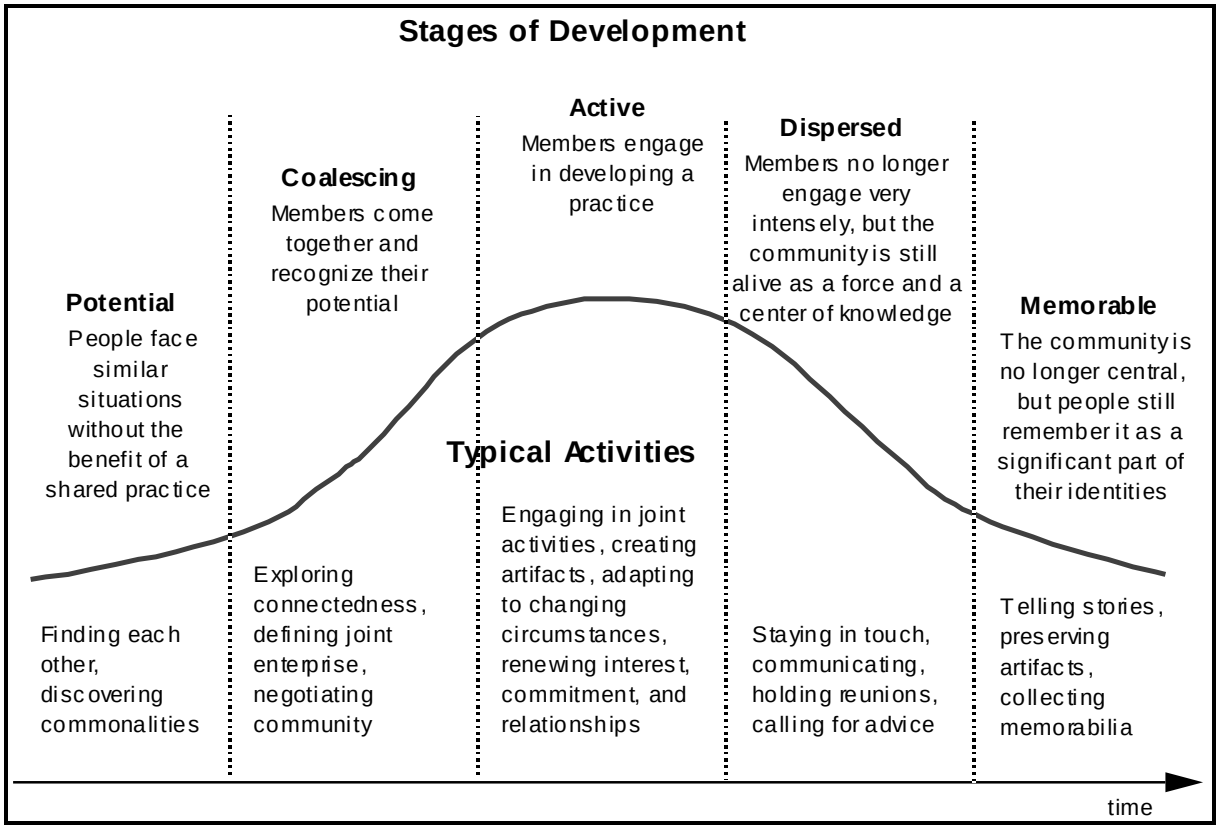


Figure 31: Wenger's 1998b model of the emergence of participation in communities of practice and LLP aspects

In SANBI's case, data has demonstrated that MacD went as far as the active stage, even though it was not fully explored. This was possible for him because he had undergone internship training with them prior to GS. That is why the mentor and the SANBI GIS team believed in MacD's potential for training succeeding newcomers who would join the team in the future (refer to section 5.9.4). In addition, the mentor regarded him as an extra hand that could take care of other roles in the team. Furthermore MacD was able to take ownership of the project which he managed to present and publish.

On the other hand the incubants from ESRI/DEA, specifically Lebo and Tso, were still finding themselves and trying to juggle GIS and business. They still were trying to see where they fit in the community, i.e. negotiating the community which is the coalescing stage (refer to 5.9.1). Similarly the incubants from LEDET have developed as far as the coalescing stage. Their mentor, Treve, could recognise their individual strengths and how he would try to intervene in their development (refer to 5.2.4.).

Finding 2: The 2.5 years incubation model has a high potential to work only if the institutions, mentors and mentees improve the constraints mentioned in the study.

1. It was evident from the data that the most of the internships' training needed a longer period for competence to fully develop. For incubants to be prepared to take up higher positions in the management of the biodiversity sector (i.e. full participation) their competencies needed to be at the level of satisfactory. In the 12 months of training I investigated, the CoP had offered most of the GIS incubants (4/6 – Calvin, Tumi, Tso and Lebo) the peripheral forms of participation mostly on the personal front rather than the professional (refer to table 13-needs analysis) that were considered legitimate (referring to competencies mentioned by Terrapon, 2013, and Skills needs ID analysis conducted by Groen Sebenza task team) and skills analysis without fulfilling all the conditions of full membership (refer to table 14) (Wenger, 1998a,b,c).

2. There were signs of the manifestation of competence during the first year of the training. This indicated that one-year training was not enough and at the same time it demonstrated that the allocation of the 2.5 year duration of the training in Groen Sebenza could allow for the full competence to develop if the challenges mentioned in the study are met. This was demonstrated by the incubants being able to improve their capabilities by allowing the following to happen:-

- to rectify their mistakes,
- finish their projects,
- participate meaningfully,
- enhance their qualifications,
- to identify/choose the skills they want to master

Moreover it was demonstrated by the incubants ability to learn or rather be aware of the skills that need to be enhanced (refer to table 13).

The mentors also affirmed that the one year interns do not get enough training, they get trained up to the level where they are just becoming productive and then they are released but with the GS incubants they become properly productive. Thus it would be important to optimise the remaining 1.5 years of the GS project.

6.2. Evidence demonstrating how hierarchical organisational structure can be assisted or can assist in developing and shaping the participation of the newcomers in their communities of practice.

As shown in section 5.10.2 and 4.2.3.2 in order for the Groen Sebenza internship to be properly integrated in the institutions under review, especially at LEDET, it required a joint effort from different levels of the hierarchical organisational structures. It was evident again that every activity conducted by one level of the hierarchy affected or influenced the functioning of the activity of the level which followed. Furthermore, it was also clear (see section 5.9.2.2. – mentors' recommendations) that for the newcomers and CoP to negotiate the competence they needed engagement with other CoP's from other institutions/departments. For example, at SANBI, Thoko and Kevin from LEDET mentioned how much they learnt during the mentor engagement workshop. Also during the National Induction Training, the incubants mentioned how they learnt from other incubants' situations and challenges. Kevin from LEDET also explained the importance of their department's internship training (i.e. biodiversity department) to be recognised by all hierarchical departments within LEDET because each department is involved, directly or otherwise. For their training to be effective, especially during the reception of the newcomers, it would be appreciated if each department could provide optimal services (see section 5.9.2.2. – mentors' recommendations). For that reason it is important to keep these relationships (i.e. mentor-mentor, mentor-incubant, and mentor-institution, incubant-institution and institution-institution) active and functional as they influence the learning that occurs in the training of incubants. And because it is important to maintain these relationships, regular engagements are key to the effective implementation of the training.

Finding 3: Internship training is not just a 'passing insignificant episode of the lives of the incubants/newcomers' [specifically those from the disadvantaged communities] but are a 'real source of hope'.

As shown in table 15 and 16 the benefits and costs of the internship training at the workplace are inseparable from those of the world of interns outside of the workplace as well as from the world of people close to them. It was clear from the data that I could not talk about professional development of the disadvantaged communities without talking about their 'functionings' (Sen, 1990) which they all value. Those included personal achievements such as a decent lifestyle, development of household functioning, cultural dignity, spiritual fulfilment and a hopeful future. However the concern that the study raised about these 'functionings' was their sustainability in the project, since the internship is temporary. What will happen to them after the Groen Sebenza training is over? I raise this question as many University graduates are unemployed in the rural areas or locations with the certifications for completion of internship training (I was also part of them; Kevin also affirmed this) and their lives have returned to the way they were as if nothing happened. So what? It is possible for these incubants to fall into the same trap and we see it surfacing in the incubant's interviews where they were already concerned about not finding jobs after completing Groen Sebenza.

Furthermore, learning from the Buhlungu and Metcalfe (2001) study I could argue that for a black person to enrol in an internship after university education is not ideal [because it is temporary] and it is not by choice – instead circumstances force them (Hausman, 2007) because immediately after acquiring the undergraduate qualification the family expects revenue which in this case is to see their children finding 'a decent job[21]'. This job should in turn be able to provide the family with financial support. This implies that if a disadvantaged black person is enrolled in an internship program they are by default perceived as someone assuming a proper job and if they are not then whatever internship training they go through should guarantee a decent job. This was illustrated by Tso when she said:

[21] Decent job – a job which is good enough to meet the incubants' and their families' needs and sustain their lives.

> They (my family) know that I'm working and I'm in this program that will help me start a business.

In addition, data has illustrated that many disadvantaged students do not study at university with the aim of only acquire knowledge but also the outcome of studying should lead to a decent job – real income.. Tumi elaborated on this by saying:

> The main thing these days is for one to get [good and relevant] working experience, and if you don't have [that] experience you can't get a job, and if you can't get a job then it's a waste of all the years of studying.

This evidence validated Sen's concept of the 'capability approach' where he argued that for some individuals to achieve valuable functioning and being they need things such as real income (i.e. absolute or relative opulence). And so the need to understand the value of being and doings, and freedom of choice by individuals, and how it influences their behaviour in different CoP's has to be recognized and assessed in the studies of internships. Most importantly is to know how these 'functionings' can be enhanced in order to enable the individuals to reach the quality of life they aspire to as well as for them to be able to participate meaningfully and progressively in the communities of practice they inhabit. This is so because not all individuals have resources to fully exploit the internship.

Furthermore, the whole person development (i.e. value being and doing) in this case did not necessarily mean the development of only the individual involved, the incubant, but it also meant the development of the objects or activities (e.g. family functionings) that they influenced, and vice versa.

Therefore any intervention for improving the experiences of interns in internship training should be aware of all the resulting implications.

Finding 4: Institutions (and its members) need to make serious radical efforts to improve internship training if they want to stay relevant and useful in the internship programmes.

1. As mentioned earlier that Groen Sebenza project and its model was not flawless but had its challenges which affected the interests, enthusiasm, and learning of incubants during the training. As reported in section 5.9.1 and 5.9.2. both the incubants and mentors felt that there were challenges, for example the budget issue, discussed with the GS task team but it did not play an active role in ensuring that the challenges were resolved and at times communication was poor. This was also highlighted as a challenge in Buhlungu and Metcalfe's (2001) study, where they argued that most of the time the problem with the agencies of internships is that they become less accountable to the activities and even learning that occurs in the internships. Though a Monitoring and Evaluation approach was implemented it was too slow to respond to those challenges even in the first year.

   It was evident that the system of searching for candidates to assume positions in the biodiversity sector by only focussing on their academic qualifications is not enough, because it disadvantages the new university graduates in finding decent jobs. On the other hand it was also clear that the universities did not prepare the graduates enough to take up workplace roles. This was demonstrated by the skills needs analysis (refer to graph 2-4) which showed that although all of the GIS incubants of this study had acquired university degrees the qualifications did not cover technical and soft/life skills which are necessary in the labour market. The worrying part was that other GIS incubants had acquired Honours and Masters Degrees for example Calvin and MacD had acquired GIS qualifications at the level of honours degree plus they obtained working experience from different internship programmes but still their skills could not make them competent enough for entry level of the internship. From this finding, this study addresses the issue that has been raised by literature (SAQA, 2012) that the universities do produce a highly academic skilled workforce of black students but not enough skills for them to access the labour market. This could be the reason why we still have minor changes of the unemployment and absorption

rate (Statistics South Africa, 2014) of young people even when they attain numbers and relevant educational qualifications.

It was also clear [drawing from Calvin, MacD's and my cases of moving from one internship to another] that the assumption about the internship programmes opening opportunities for a decent job may be overrated. It could mean that employment for interns does exist but only caters for a particular group. This is a problem which is again responding to the demand side of the labour market (SAQA, 2012).

Thus, the evidence mentioned above should sound an alarm to the education system, higher education institutions and structures that supply labour to the environmental market, to truly reflect on the relevancy of their academic disciplinary knowledge and curricula and start making radical changes to suit workplace situations otherwise the full participation by black newcomers in the biodiversity sector will remain a dream. Moreover this will not only be the struggle of black newcomers or communities but will affect the human capital which will ultimately affect the country's economy at large.

The higher education institutions are not alone in being accountable for the problems of participation of newcomers. As long as the internship training at workplaces are perceived and operate as they do now, we will find the country's capital being invested in promising strategies which are supposedly skill development strategies. It was evident from data that there was so much hope that the incubants/interns expected from the internships and that hope was for the internship experience to be transitioned into a decent paying job. But if the internships are still perceived as free labour, as most institutions still do, which tends to replace full-time employees then we will remain with increased unemployment "which will contribute to worsening economic conditions and failing to reach one of the macroeconomic goals of full employment" (Pologeorgis, 2014, p. 8).

The successes and challenges which are addressed in this study are not unique as they have been mentioned in other internship studies conducted in the medical

field, social science studies, media and sports management (Lerato T. J – Editor of TrueLove Magazine, October 2012 – The intern Agenda; Buhlungu & Metcalfe, 2001; Koyana, 2014; Surujlal & Singh, 2010). The decision makers of internship programmes may be slow to respond to the challenges that emerge and the most disturbing part is that it occurs at the cost of the lives of young university graduates. This was demonstrated by Kevin when he said that every year at LEDET they have internships but there was no tracking to show whether they eventually find employment (refer to section 5.9.1. – one year internships are flawed).

2. The assumption mentioned above about the internship programmes leading to the interns/newcomers having a better chance of finding decent jobs needs to be reviewed especially when it is not known whether that happens. So far in my research I have not seen anyone monitor that link. What would be useful is a database in the environmental sector especially the GIS field which shows the movement of interns who completed internship programmes in the environmental sector or a database which assists corporate institutions to select the interns. Access to the internship programmes in the environment sector is very limited which was evident from this study when it was demonstrated that most of the GIS incubants in this study waited for a while [some more than a year] searching for employment or internships. At least two were internship hoppers.
   The fact of the matter is that, even if they do get enrolled into internship programmes there is system that ensures that the interns get preference as a result being in the internship and it does not guarantee job security. So there needs to be a motivation for black students to enrol in internship programmes after graduation and a motivation for the institutions to conduct internship programmes aimed specifically at the underprivileged black University graduates.

3. Developing Internship Policies is not enough especially if they lack complementary support services. For instance at LEDET they have an internship policy with potential resolutions (LEDET, 2012) but in practice they take time to take effect. For example the policy stated that their internship programmes take a maximum period of 12 months but it took the department almost 11 months for their Groen Sebenza

incubants to receive proper working equipment. This could mean that if these incubants' period of service was 12 months [like the interns who go through their annual internship programme] they would have only experienced a proper practical training for about a month before their service ended. Many a times the incubants were doing admin work or waiting around for work to do (refer to figure 31). The example of LEDET reflects the situation occurring in many biodiversity institutions. Using LEDET as an example is not intended to humiliate the institution but to highlight the fact that these problems exist so each institution can start interrogating their behaviours and make critical changes.

Also the policy from ESRI which uses a generic format for all newcomers may not be sufficient for all situations. Gathering data from the incubants I noted that their training was aimed at them understanding GIS skills in the business context. Which means they needed both the skills of GIS application and a GIS developer..

And if these policies are not been reconceptualised and it can be thought that "they are being used as a way to free labour where employers are cycling through interns without any intent to hire them for a full-time basis and this results in displacing existing full-time workers and increasing unemployment" (Pologeorgis, 2014, p. 7).

4. Managers, like the managers of this study see interns coming and going every year and in many cases they do not know what to do with them (Lerato T. J – Editor of TrueLove Magazine, October 2012 – The intern Agenda), as Kevin said "the point is you can have 100 people here and if there is nobody to receive them what would you do with them" (Kevin 2).

   The internship training needs a continuous and effective monitoring and evaluation system to ensure that learning occurs and ensure that the members of the CoP are accountable. It cannot be assumed that being part of the internship automatically results in the readiness of incubants to take up occupations. Since the study has revealed that every level of the organization structure is responsible for ensuring that proper learning occurs in the internship training, thus the monitoring and evaluation has to occur at different intervention levels.

   Furthermore, the HSRC report (2009) has exposed that South African Universities are lagging behind in terms of their education relevance to the workplace skills and

knowledge prerequisites, as a result the learning occurring in the internships cannot be overlooked

5. For instance the institutions need to reflect on the cultures they have created regarding their internship programmes. By cultures (refer to section 5.6.1. - culture) I include the arrangement of interns' workstations, policies, language and communication, relationships, gestures, behaviours, teaching styles, etc.
   A key factor about culture which emerged from the study and I was not sure whether I should be concerned or not, was "should the incubants/newcomer share the same office with the mentor or not OR should the incubants/newcomer share the same office with their peers OR both? As far as the Wenger's community of practice concept is concerned, I claimed that separating the incubants/interns from their mentors insinuates power relations which limited their ways of creating meanings, participation and understanding the practice, because it is not only through instructions that the newcomers in the community of practice learn the practice but it is also through observing how the mentors handle situations, how they behave, so as to create meanings, negotiating membership, and developing the identity. Another reason was that how the incubants would learn the norms of the practice if they are separated from their mentors, to some extent it could bring about a sense of not belonging or an out-group, as a result it may hinder their learning. This was indicated in the case of the incubants from LEDET who felt neglected and not belonging. Also if the incubants are separated from the mentors they will learn what they perceive is relevant or right, and what is right for them as newcomers might not be right for the practice. This was demonstrated by Thoko the mentor from SANBI when she talked about the incubants who sometimes have the 'school mentality or attitude' in section 5.8.2. This could demonstrate that for the newcomer to erase their 'school mentality or attitude' they needed to displace it with the workplace attitude with guidance from a mentor

   Remember again that experienced members or mentors are more likely to be autonomous learners as such they might forget how basics are taught. Cornford & Beven (1999) further argue on this point by saying that "experienced workers are potentially in a position to be more pro-active and in charge of their own learning.

Generally, they know whom to ask when they need information … However, because they already possess substantial stores of knowledge and skills, the relative amount of new knowledge which they need to acquire is less than newcomers for whom almost everything is new. Furthermore, the bodies of knowledge and skill possessed by these more experienced workers may mean that they can use them in the faster development of new knowledge and skills than novices who do not possess these new subskill components ” (p. 34).

Even though Wenger (1991) did not mention whether the newcomers should always share the same office as the mentor/master, in his examples of apprentices there was always someone either the master or fellow apprentices who were ahead of the newcomers from whom the newcomers learn. In this study all the incubants were placed in offices separate from the mentor or any experienced newcomer which drastically affects one's opportunity to learn from the master.

6. As mentioned above the development of policies and putting structures in place does not necessarily mean that the CoPs and its members are supported. The policies and structures on their own cannot make things happen, there needs to be someone to facilitate, monitor and ensure that policies are implemented and structures are in place and are continuously examined and updated if necessary to keep the CoP alive and effective. It was obvious from the data (specifically the data from the mentors and managers from LEDET in section 5.9.2.) that even when the policies and structures were in place mentors from LEDET still lacked the physical actions to facilitate them, for instance mentors needed backing from the institutions with financial support, operational resources, aligning their mentoring duties to their normal daily duties/key performance areas, from the Human Resources department to allocate incubants with the necessary working equipment, etc. but it did not happen or only happened after a while. This created problems for the mentors because in most cases the mentors did not have time to mentor and were distracted from their normal daily duties. This was due to the fact that the mandate of their departments kept on increasing which also affected their mentoring efforts. Perhaps mentors need to be compensated as Thoko suggested for effective training to happen, as research has shown that compensated mentorship does enforce

better production because it is arranged formally as opposed to unpaid mentorship where the level of success is mostly depended on the willingness of the mentor (Fray, 2013). Also as noted from this study mentoring is not come easy, it requires intense effort.

7. Another challenge of the study which questioned my understanding about the concept of legitimate peripheral participation especially about who or what qualifies the individual to be an expert in the communities of practice, was when the incubants raised the matter of wanting to register with PLATO. In order to register they needed to have been mentored by an expert who was a qualified or registered practitioner. For instance, Treve, the LEDET mentor was regarded as an expert because he understood GIS better than everyone in their department. But he did not regard himself as such as he was not a GIS specialist he was the herpetologist. In my understanding he played the role of a peripheral participant in the general CoP at the same time in his department, he is a core participant.

   Lave and Wenger (1991) discuss modes of co-participation in LPP. They argued about 'changing work contexts or participation frameworks' where the learner is either continuing expanding repertoire of participation (i.e. structure acquisition) or the learner is learning how to do practice by playing different roles in various fields of participation. Because the mentor-learner relationship is dependent on the learner learning from the master, there was a concern because at some point the newcomer will have to assume the roles of the expert.

   So, going back to Treve's example the LPP concept does not address clearly the question about what kind (e.g. longitudinal and/or latitudinal OR horizontal accumulation or mastery of role (s) of participation) of a learner/newcomer participate at what level of the periphery in CoP, and at what level of expertise is the expert considered the expert, especially in the scale of an institution. For instance, in Treve's situation, he did not occupy the GIS expert position in his department because he is the master of the occupation/role/practice but rather he occupied the position because the role of GIS specialist needed filling (i.e. for convenience and to assist the GIS incubants) OR he just filled the role temporarily. Remembering that the

LPP is about how roles are occupied and the ways of engagement but it is not concerned about the structure in which engagement takes place, so in terms of participation where would you place a newcomer of that institution/CoP in relation to Treve's case mentioned above?

Lastly, the concept of the community of practice depends on the strength of its three core structural dimensions that is the domain, community, and practice. It can be ambiguous in setting the boundaries of those dimensions especially in an organization. This study found that the concept of a CoP is very broad; and it can be a concept where everyone or everything can form part of it which is good. However, the flip side of this concept is that it is based on many assumptions. For instance, the matrix (e.g. interactions, scale and time) of how the concept is defined are vague in practice and as a result its application can become very loose.

Finding 5: The mentors and incubants need to make the process of reflexivity real and practical

1. Reflexivity is about the evaluation, feedback and urgency of actions. The fact that there was little time spent in evaluating the progress of the incubants and in many cases it was not documented; was a concern in this study. With all the other administration work which both the incubants and mentors complained about, how would they be aware of the progression of the incubants, specifically of their professional development, if they were not documented? In many cases they mentioned sections of qualities that needed improvement which in many cases related to the tasks they were conducting at hand. Even if they were targeting one quality per challenge, there was no evidence showing that as I did not receive monthly/weekly or quarterly reports and they mentioned that they did not have time to submit the documents.

There was a need for both the intern and mentor to continuously reflect or introspect on the things (e.g. professional and personal traits) needed to make the internship's training work. For proper learning to occur in the internship depends on the relationship between the mentor and mentee (Holyoak, 2013; Fray, 2013) and it requires them to be as adoptive and adaptive as they can due to the complexities of the demand of the jobs (i.e. GIS) they occupied.

6.3. Based on the evidence provided by the data from this study, it was appropriate to suggest a model which can be useful for the stakeholders [who play a vital role in the development of newcomers' careers] to improve the internship programmes in the environmental sector.

This section is designed to inform decision makers and to provide guidance on how the study's findings could be applied.

Human Capital Development Strategy for Environmetal Sector (2009-2014) stated that "There is an urgent need to work towards a more *pro-active, integrated approach to skills development* in the sector, to address the skills development lag, and/or duplication of effort and systemic inefficiencies" (p. 7). In addition, this study argued that the 'learning and training occurring in the internships cannot be afforded to be overlooked'. And this is what this model intends to respond to, also the model responds to the Professional Development Conceptual Framework recommended by the HSRC (2009) report.

Recurring messages across the study data was that the internships are important and useful in sustaining the decent lives or 'functionings' of the newcomers. This has invoked many issues related to how the internship programmes in the environmental sector can be improved in order to cover the spectrum of career developmental stages or career pathways for disadvantaged university graduates. It is not guaranteed that these internship programmes occurring after the university graduation will truly make a significant change in the increasing of active participation which will lead to full participation for the sector transformation. It is known from the HSRC (2009) report that amongst the few black university graduates who have chosen careers in the environmental sector only a few succeed. Among those who have succeeded face challenges such as:-

- the context in which they live, their personal aptitudes, and educational attainment (Shumba & Naong, 2012),
- Environment related careers and jobs are not familiar to black people specifically those who are from disadvantaged rural and location areas (SAQA, 2012),
- To be successful in environmental sector careers you need to have acquired higher educational qualifications which in many cases require a lot financial input which many disadvantaged black students do not have (Shumba & Naong, 2012),
- And those who have environmental careers are mainly there because they did not get the opportunity to join their first preference careers such as doctor, lawyer, teacher, geology and so on (refer to table 3 in Watson, McMahon, Foxcroft & Els, 2010). It was also evident from data that Tumi, Tso and Lebo's 'first love' was not to work in the environmental sector (refer to section 4.2.)
- Also drawing from my own experience, for black people especially those from rural areas, conservation of the environment is their livelihood because they live and depend on it, whether they are conscious or not of their reliance on nature. Therefore it is difficult for black people especially those from the rural areas to see the environment as a place in which one can develop a career or even to see the environment as an area in which one can invest his/her learning at university level. This is influenced by the fact that rural areas are associated with poverty and unemployment and for someone to live a better life and be employed/employable they need to move out of the village and migrate to the urban areas (Daniels, Partridge, Kekana, & Musundwa, 2013).

So in order to deal with the implementation of the internships more effectively in the environmental sector we need to first deal with those issues mentioned above.

Firstly there is a need to groom and nurture the newcomers from an early age into the sector (HSRC, 2009). For instance the South African education department's curriculum states that the Grade 9 learners should be introduced to different careers in order for them to be able to select the appropriate subjects for the careers of their choice in Grade 10. This could be the right time to advocate environmental careers in secondary schools especially the schools in rural areas. The approach used by the environment-based institutions for the

introduction and advertisement of the environmental careers should be thought through critically [informed by the social issues mentioned above] before implementation.

As mentioned in Chapter 1 choosing a career and learning pathway is a mental and practical process (Saunders et al., 2013). As much as choosing the career depends on the individual's efforts as well as the individual's responsibility to ensure that s/he learns relevant skills and acquires the relevant knowledge but it is also the structures or institutions' responsibility to ensure that the individuals' pursuits are realised.

Lastly, it is evident from this study that when students exit the university institutions they are not ready to produce the skills and knowledge needed by the workplace (also supporting the HSRC (2009) report's findings. Similarly other studies revealed that the learners specifically from the disadvantaged (rural) communities they are not exposed to the diverse careers and career knowledge when they exit the secondary schools (Mmema, 2010; Du Toit, 2010) so some cannot make informed decisions about the careers they want to pursue or their families do not have the financial means for them to study further (Shumba & Naong, 2012). This was also evident from the fact that Tso wanted to further her studies but she could do so only if she was awarded the GS bursary. For those reasons this study suggests that the 'freedom to choose' and succeed in any project which any individual [predominately the disadvantaged black people] want to pursue in life needs an intervention from the early stages of their lives. When the students graduate in a particular field (CoP) and want to diverge to another through employment, it becomes difficult and takes longer for the student to grow and succeed in that field (CoP). This is what emerged from the cases of Tso, Tumi, and Lebo. They graduated in a different field from GIS and now they are pursuing a career in GIS they are expected to be ready to fully participate in the field. This might be too much to ask for.

It is also clearly visible that the focus on mostly theoretical learning and skills and less on practical/technical learning and skills by the universities is not balanced and it is not good for the corporate world in the environmental sector since in most cases they require the balanced skills of both.

The model that this study suggests is based on Sen's 'Capability Approach' which argued that we cannot always assume that individuals doing or achieving the same project received

the same opportunities prior to the project. This means individuals with prior knowledge and skills [and support] can do better in a project at hand than those who did not (Shumba & Naong, 2012). For instance, a student who went to a secondary school which supported environmental careers [such as eco-schools] and graduated from university with a well-resourced environmental department [i.e. research, theoretical and practical; practical work include going on field trips and studying real-world environmental issues] could do better in the internship programme than a student who never received or only received a minimal exposure. For instance MacD worked as a computer technician during the last year of his GIS degree, i.e. 2009. In 2010 he became a computer science tutor for fourth year GIS students, in 2012 he became a GIS technician at SANBI. Therefore it was not surprising to see him flourishing in the GS project especially in the field of GIS because he was exposed to the field earlier as opposed to Calvin who graduated in GIS but only worked as a GIS intern once and even then did not specialise in his field; or as opposed to Tso, Tumi, Mosidi and Lebo who did not have a GIS background.

This model is based on Lave and Wenger (1991)'s concept of the Legitimate Peripheral Participation which stated that to be a member of a community of practice you need to develop identity, create meanings, produce and reproduce knowledge and become a practice. And creating a meaning and identity, and becoming a practice are processes. It is evident from this study that the internees after graduation from university can only do so much especially in the first year of the programme with regard to the preparation of participation into the environmental sector as the community of practice. And in most cases the learning that occurs is in the peripheral and very few can move outside of the peripheral. On the other hand and very importantly these processes should not be rushed (HSRC, 2009). The main idea of this model is to reasonably identify the appropriate time for the newcomer to become a member at the same time allowing the newcomer to spend time to learn the practice and grow from the peripheral participation prior the internship programme.

6.3.1. The outline of the model

Based on the data from this study it showed that:

- Intervention for 12 months in the internship training for the newcomers to be prepared for full participation in the GIS CoP's is not enough, especially for students who; like Tso, Lebo and Tumi do not have a background in GIS. Even though they had passion and determination to excel in their work the 12 months period spent for them to acquire proper skills, knowledge and competencies was not enough. Considering also the environments and approaches provided by the organizations did not optimize their capabilities (refer to the challenges faced by the Biodiversity Planning and Management directorate of LEDET and refer to 5.7.1. especially to Tso's confidence about not having the competencies to open her own business but rather settling for getting a job which is not what she really hoped for.
- The development of this model is also influenced by MacD's experience that throughout his career path of becoming a GIS technician, the conditions and structures have equipped him and directed him until he landed in the occupation he wished for (refer to case study 4).
- This model was also informed by the career path Calvin took, whereby even though he studied GIS until Honours level, his work experiences for GIS training did not endow him with the skills, knowledge and competencies he wished for. For instance, he worked at the Limpopo Department of Rural Development and Land Reform as the GIS intern, but he never finished that programme because they were focussing on spatial planning which was not in accordance to what he studied and wanted to pursue (refer to case study 6). He was interested in applying GIS skills in the environmental management field which was offered by the GS project, however even then he was not receiving the support he needed.
- The development of the model was informed by how Tumi has also shown her determination to understand and succeed in the GIS field however she also mentioned that her first love is still Geology, should the opportunity arise in the geology field she would grab it and perhaps integrate GIS into it. This shows that

passion and willingness can only take you to a particular point especially if your whole heart and being is not there.

- Lastly, looking at the importance of GIS skills; drawing from Ben Cobbling's opinions, and table 3 which shows a number of occupations requiring GIS skills as a pre-requisite, I wondered why the GIS skills cannot be taught in the early ages of the students' careers even though not everyone who does environmental studies requires GIS skills. The concern is that not everyone who does environmental studies leading to a particular job requiring GIS would know that the GIS skills are needed specifically if the GIS course is not integrated in the curriculum. The concept of an internship or rather apprenticeship and its application has a long history (refer to section 2.2.1.) of the newcomers identifying with the practice either at the early stages of their lives (e.g. Yucatec Mayan midwives) or early stages of their career (e.g. butchers/meat-cutters) (Lave & Wenger, 1991).

So the most important attitudes this model requires is the synergy/co-operation amongst the (a) secondary schools, (b) higher education and training institutions, and (c) government and private corporate[22] institutions (HSRC, 2009). Also the quality of every training programme involved would have to be standardised and monitored at all levels and would need to be accredited by SAQA as per the GS task team suggestion. Lastly, the training programmes will have to be given the NQF level status. Because the institutions mentioned above will be working together to ensure that the training programmes (i.e. Gap year training programme and Internship training programme-which will be explained in detail below) are recognised then they should be regarded as the pre-requisites for entry to the higher education institutions and workplaces.

This model consists of three phases which are as follows:-

[22] Corporate in this case is also inclusive of NGO's and government agencies.

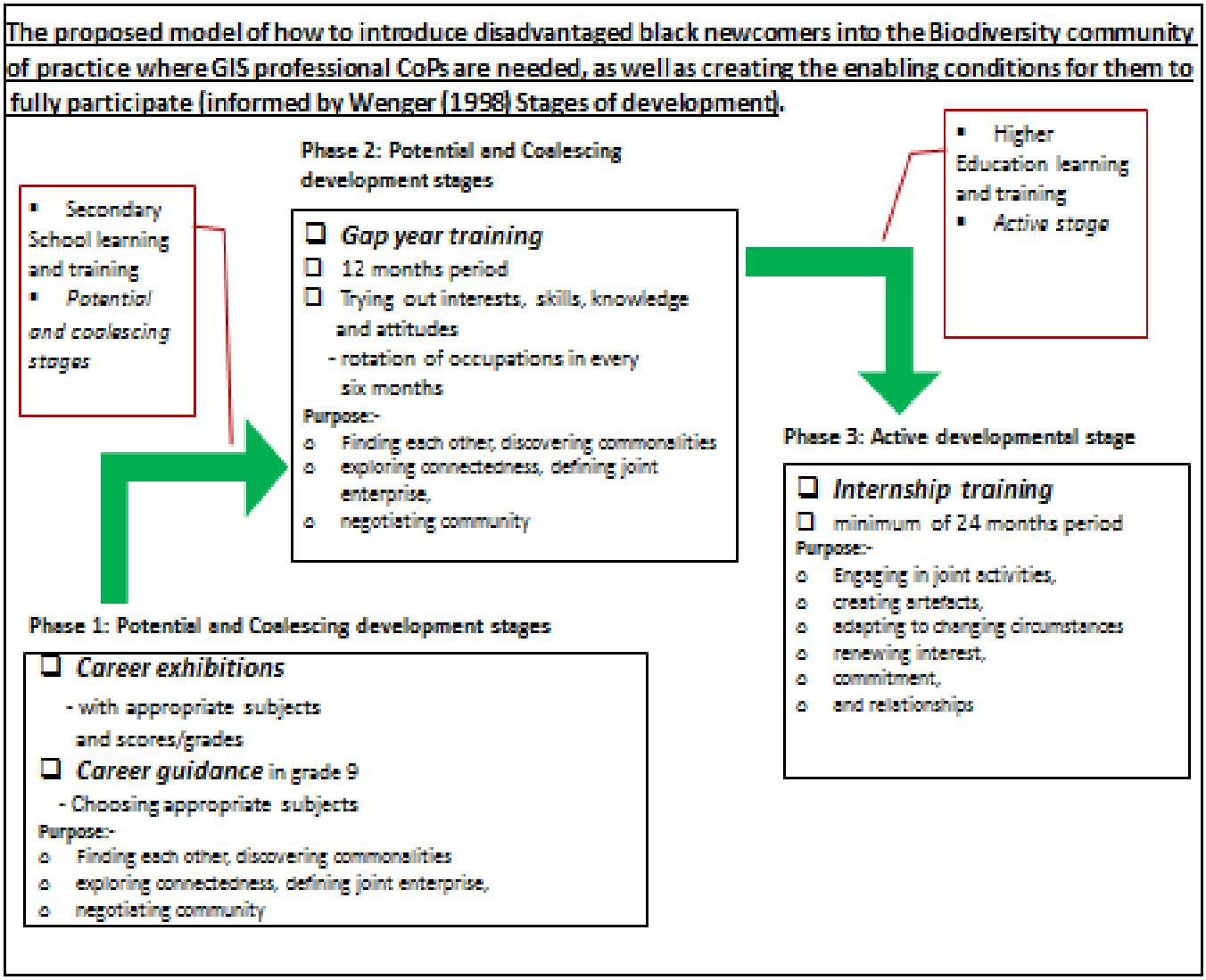


Figure 32: A summary of the model for introducing and developing newcomers from disadvantaged black communities into the biodiversity sector.

6.3.1.1. Phase 1

The efforts to educate about the value and protection of ecosystem services and natural resources has been promoted (Gretchen et al., 2009), but it is not sufficient especially for learners from disadvantaged communities. Hence they cannot be excluded especially as their opinions are required for guiding the National Biodiversity Strategies and Action Plans. As indicated by Stoll-Kleemann and O'Riordan (2002) it is within their democratic rights and is legitimate to engage in the management but more especially important for them to share knowledge and understanding that will ultimately improve their participation and

knowledge in the GIS CoP. For that reason, there needs to be proper career exhibitions and career guidance about biodiversity occupations, including GIS professions, and careers especially for Grade 9 learners.. I propose that career guidance with more emphasis on the Biodiversity careers requiring GIS skills must be employed at the level of Grade 9 (as one of the focus areas of Life Orientation subject is career guidance). For instance in Grade 9 is when learners are introduced to maps skills (Department of Basic Education, 2011) but it should not just only be a classroom activity but rather it should be extended to being meaningful where the learners can recognize a career out of it. I emphasise this because in the study Tso mentioned that:

> You know I did GIS in Varsity [university] but still I didn't know as much as I know now … because the other thing you don't give it your all in varsity [university] and you don't really get time to practice on your own … here there is data and software you can practice on your free time (Tso 1).

She was only exposed to GIS at University and even then she could not create meanings until she worked with and made sense of GIS at the workplace.

In addition, studies conducted by Du Toit (2011, Thesis) and Mmema (2010, Thesis) indicated that learners from the rural areas lack knowledge and guidance about careers as opposed to their counterparts from urban areas. This was due to the learners from urban areas having more and better resources e.g. access to computers and internet, and are exposed to more diverse career choices and information than those from the rural areas. Exposure to computers is a vital platform for GIS training and application so the idea is to expose the rural learners to GIS skills so that they too are able to relate them to their environment.

6.3.1.2. Phase 2

Gap year training after graduating from matric could be useful especially as most of the first year higher learning students cannot always make informed decisions about the careers they want to pursue (Shumba & Naong, 2012). The main aim of the gap year training is for

the newcomers to try out GIS skills, knowledge and attitudes to see which jobs within the GIS field fits them. This will encourage the learners to apply for the careers they are enthusiastic and passionate about which they have tried out and are familiar with. I propose this phase because instead of having internship hoppers like MacD and Calvin, specifically Calvin because his initial internship was not in line with his career pursuits. It is better to invest effort in the intervention that it is likely to allow the participants to grow but not only that but assist in fulfilling one's self-worth.

This is how I propose it will take place: it will require each learner in Grade 11 to choose 2 preferred careers (informed by the higher education institutions' career guide) they want to pursue. The schools will have to apply to the institutions, preferably to their municipalities (and tribal offices) for their learners to try out jobs. In return, this will help in capitalising local skills development and the learners could work with relevant issues so can be innovative in finding solutions. Environmental issues and environment-related issues will never cease and will always affect or be affected by other issues related to Values, Cultural, Social, Technological, Economical, and Political issues.

So the next step is every six months the learners would rotate between jobs. Then would then proceed to the universities with a better idea of what they want to do and how the theory learnt at the universities could be applicable to their situations.

Of course this model could sound impractical especially that it might create overstaffed municipalities as a consequence the outcome of training and learning might not be as expected, however the model will also require other stakeholders and institutions to adopt learners and to provide them with training. This model is looking at the context of the environmental sector, so only the learners who choose careers in biodiversity, especially GIS related careers, will be enrolled into this model.

The Gap year training will not be structured like the Internship training. Firstly it will last for 12 months. In most cases the leaners will be observing and doing tasks at the peripheral level of projects, but seldom doing in-depth activities. They will be more like personal assistants to their mentors.

6.3.1.3. Phase 3

After interrogating the theory at the universities and making sense of them, the students are now enrolled into the internship training programme. This internship programme will operate in the form of an apprenticeship (in addition to what Treve recommended in 5.9.2.2 - mentors' recommendations). So the execution procedure for this phase will be informed by all the concepts about training and support discussed in this study. The assumption of entry and exit at this phase is that the newcomers' development of identity in the GIS CoP would have at least been pushed as far as from the start of the peripheral participation towards the exit of the periphery. So if I were to use Wenger's (1998b) model of emergence of participation in communities of practice (refer to figure 6) the newcomers would have been at least exploited the potential stage.

The model encourages the following activities:-

(i) the internships to be made 'easily' accessible to all kinds of students (Walji, 2010)

(ii) the model should be able to assist and encourage higher education institutions to motivate students to enrol in internships, EITHER

(iii) students/newcomers enrolled into internships should be able to identify job opportunities and occupy them immediately after the internship, OR

(iv) the corporate institutions should be able to select potential candidates from the internship programs network/database and, lastly

(v) Learning and training in the internships need a system approach which will be continuously and effectively monitored and assessed because the nature of work keeps on changing. We cannot be naive enough to assume that being part of the internship would automatically result in the readiness of incubants/newcomers to take up occupations,

(vi) The overall point is to ensure that job security is guaranteed.

The ideas of these five outcomes that this method encourages were extracted from the data, mostly from the recommendations provided by the incubants and mentors (both from

the participants of the study and the evaluation forms from the December national induction training). It is also informed by the issues raised in the HSRC (2009) report. I felt that we cannot 'turn a blind eye' on these issues and I as a researcher in the environmental sector should play my part.

It was evident from the data that if the internships are regarded as contributing to skills development but their training approaches are still invested in the traditional way of doing things with no critical interrogation and actions, then they are bound to have no beneficial use.

This method is beneficial because:

- the higher education institutions would have to integrate a curriculum which can prepare 'interested' students for the workplace,
- it will mitigate the interns' panic about their future post the completion of internship programs, because I believe that the unintended outcome that the internship training aims to achieve is not to produce young graduates who are frustrated about finding jobs, but rather the internships intend to produce capacitated, competent and confident graduates who are happy to occupy jobs with more responsibilities so as to truly transform their situations and contribute to social and economic development,
- also the corporate institutions will not have to invest a lot into training the beginners. Internships can be considered as an entry-level job.

"Once institutions had been established to manage parts of the system, they inevitably guarded their responsibilities and would not give up their authority without significant contestation" (Wedekind, 2013, p. 8).

6.4. CONCLUSION OF THE RESEARCH STUDY

I will start off this chapter by raising the issue which I introduced in Chapter 2 and emerged in the results but I did not discuss it, namely the issue of racial discrimination and prejudice in workplaces in particular in the internship training. In Chapter 2 I explained it in the context of the mentorship and in the results it was revealed in a story and in this chapter I discuss it as something that is real and cannot be ignored. It is real because I too as an intern experienced it. I use my experience here with the understanding that even if some incubants have demonstrated it figuratively, I as a researcher have to respect the ethical principles of this research. In Chapter 4, graph 2, it was not surprising to see the GIS incubants having difficulties with negotiating in a conflict, because first of all a newcomer, especially from the disadvantaged community is vulnerable. Desperation which is caused by the urgency of doing what is always expected of them as well as 'moving out' of poverty, a desperation that can only be reduced by finding a decent job. But because the internship is not a job per se the newcomer understands that at some point they have to leave and seek decent jobs for themselves. Their future is blurred so it would be difficult for a newcomer to speak out if they had been discriminated against or if a particular act against them was inappropriate. Donald and Westphal (2013) have said it that some of the racism behaviors need not to be apparent and are often hidden. For instance some can be hidden under the institutional processes and frameworks. According to Donald and Westphal (2013) in the categorization of groups, in-group and out-group, the in-group old timer can easily tell the newcomer who is also from their group the secret of surviving under those circumstance but would not do the same for the out-group member. This implies that, the in-group old timer has the means to ensure that the development of the newcomer who is also from their group happen, but would not do the same to a newcomer who is from the out-group. This was illustrated by Thoko when she said:

> We have not used the Groen Sebenza budget, I think it was my first time using it for him to attend this forum (biodiversity planning forum, 2014) … otherwise for all other things I always [make means to] find sponsors from other institutions for him … I always look for those opportunities in projects that are taking place … and check

> if they have a budget set aside for training young scientists, [I ensure] he becomes part of those scientists who benefit from it (Thoko 2).

This however could be as a result of identifying with a newcomer as in-group or could be just her personality/attitude. This again stresses the fact that if the structures and policies (institutions) are flawed it is going to be difficult to identify racially discriminating treatment. Hence this study encouraged the institutions to be reflexive of their practices.

In addition, Pologeorgis (2014) from the USA addressed the issue of socio-economic inequality in the internships by looking at those that are low-income (or unpaid). He said that they too can exacerbate the socio-economic inequalities because the "high-quality and prestigious internships tend to favour the students/interns who come from affluent or relatively wealthy families and can afford to work for free or for lower wages" (p. 8). So those from disadvantaged backgrounds may not necessarily have equal access to opportunities which will result in "the top economic tier becoming less and less diverse". He further mentioned that the interns who take low paying internships are likely to get the jobs that are low paying thus the jobs will not necessary take the interns out of their poverty. Lastly Pologeorgis (2014) continued to argue that not only will the interns from disadvantaged communities have unequal access to internships but also the social and economic mobility of labour will limit their access to internships. For instance the internships will only cater for those who can move away from their homes and relocate to where the internships are offered. But those who cannot afford this, it will not be possible. The arguments that Pologeorgis (2014) raised here respond to the question I raised in the beginning of the thesis, Chapter 2, which was "how are the mentors and institutions going to deal with the context of developing the capabilities of university graduates who are from the historically underprivileged communities where poverty related issues and other socio-psychological ills are prevalent?"

I by no means imply that any of the participants of this study were racist in any way. I simply and clearly want to point out that racial discrimination is real and can affect the learning and training of black newcomers in the biodiversity sector. And it needs to be openly addressed and dealt with radically. If we do not deal with it the black newcomers will always remain in

the periphery of participation or vulnerable. Moreover the internship training will always be created without making any impact or meeting the interns'intentions.

In Chapter 4 and 6, and all the findings of the study discussed, I mentioned significant data which I described as having a feedback loop. In this study I recognised that the only things that stood in the way of the challenges mentioned that could improve the experiences of the incubants and Groen Sebenza were 'a need for a better way of communication and engagements'. This is so because communication is known to be an interaction which is a two-way process and has feedback (https://www4.uwm.edu/cuts/bench/commun.htm extracted on the 18th of November 2014). Parties who are communicating or interacting need to receive feedback. They should know that if there is no feedback then change and innovation will just be a fantasy.

Another feature I found worthwhile was the perceptions of internships by the incubants and by their extended families. For many black graduates the internship training is real and meant a job and for some it was a source of hope for a decent job. And this hope did not end at an individual level of needs but it extended to the hope of their families. Thus any internship training has to recognise its value and be executed to ensure that those who participate in it receive proper benefits. As Tumi elaborated:

> The main thing these days is for one to get [good and relevant] working experience, and if you don't have [that] experience you can't get a job, and if you can't get a job then it's a waste of all the years of studying.

In addition the research conducted by the Centre for Development Enterprise (CDE) (April, 2013) showed that the number of black graduates has tripled from 200 000 in 1995 to 600 000 in 2011. If they become unemployed, the 'side effects', could be, among others, a vulnerability to extreme poverty, also the youth may become dependent on their parents which has a knock-on effect on the socio-economic settings.

This study continues to emphasise what Koyana (2014) and Steyn et al. (2002) state that post-qualifying training and education via internships are still needed. As much as they are needed the most important matter is to safeguard the learning that happens in the internship trainings/programmes and the learning needs to be monitored and assessed

otherwise all efforts may end in vain. It was important for this study to understand what graduates are capable of in order to see where to intervene especially if the intentions are to retain them and transform the sector. Some aspects that the interventions for internship training can look at are: the educational background of the graduates, the socio-economic context they are growing in, the nature (structure, location and organisation) of the workplace and the character within which those workplaces are located (Sen, 1997; Byrne, 1998).

Also importantly the investigation of internships cannot alone impart enough competencies for the transformation of the sector. The need to investigate the learning and career pathways of those interns who participate in it is vital. The path should start at the level of the learners from schools selecting the subjects for biodiversity careers as elaborated in the model suggested. This is because the transition from one phase of development into another is a mental, emotional, spiritual and physical process and not everyone can master it immediately, especially in the biodiversity sector.

To avoid students staying at home for long periods looking for jobs or internship opportunities, as well as acquiring insufficient competencies for the jobs, the universities need to partner with biodiversity organizations.

I must admit that for sector transformation to happen especially via internship programmes for underprivileged black university graduates there is a lot to be done. However I still emphasise that if such internship programmes are critically imagined and approached differently there is a lot to achieve. There are however many strides that have been made for instance by the WWF by locating the movement of their interns (i.e. conducting labour economics) (Raven & Stellenboom, 2014) also some interns in GS have been absorbed (in this study Mosidi being an example). The concern however still is “will the sector train the newcomers enough to become full participants or are they still going to continue to be at the periphery of participation or if they do become full participants are they going to be competent?” I say this looking at it in the context of employability which Pologeorgis (2014b) explained it as “based on a set of individual characteristics. It is not equivalent to employment, but rather a prerequisite for (gainful) employment. It pertains to someone's relative ability to obtain and maintain gainful employment, as well as make successful

transitions from one job to the next … is a contributing factor to the individual's personal well-being and growth”(p. 1).

6.5. RECOMMENDATIONS FOR FUTURE RESEARCH

There is still a need for more research on the experiences of the newcomers especially the black disadvantaged university graduates in the internship training within the GIS CoP in the environmental sector as well as the labour market monitoring of the interns, to see if the internships are really living up to their promises. In particular, the study has revealed these areas that require future research:

- The need to extend the sample size
- The need to further use and explore the model suggested focusing on the learning and career pathway developments of students or rather GIS students and interns in the GIS CoP
- Monitoring and evaluation of learning and training especially of the newcomers in the GIS field
- A need to understand the concept and history of the ‘internship’ in the South African context in relation to transformative intentions in the sector (i.e. work integrated learning).

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INFORMANTS/INTERVIWEES IN THE STUDY (i.e. pers.comm)

Heather Terrapon (2013) – The GIS expert invited to the National Induction Week. I attended her session during that week.

Ben Cobbling (2014) - Director of CSS, Geographical Information Specialists. He was interviewed via emails in Grahamstown.

Ms. Vivian Malema (2013) – Director of the Groen Sebenza project. She was interviewed at SANBI, Pretoria Botanical Gardens.

Mr Donovan Fullard 2013) – The manager of Groen Sebenza project. He was interviewed at SANBI Pretoria Botanical Gardens.

Dr Tanya Abrahamse (2014) – SANBI-CEO interviewed during the Biodiversity Planning Forum at East London, Mpekweni Beach Resort. South Africa.

APPENDICES

Appendix 1: Letter of request for permission from incubant

RHODES UNIVERSITY
Where leaders learn

Rhodes University Environmental Learning Research Centre
PO Box 94, Grahamstown, 6140 • Tel:046-603 8389 • Fax: 046-622 8028 • E-mail: i.schudel@ru.ac.za

8 October 2013

Dear Sir or Madam

My name is Ms Morakane Madiba and I am studying a Masters in Environmental Education with the Environment Learning Research Centre at Rhodes University, Grahamstown. My supervisor is Prof. Heila Sisitka

I am requesting your participation in my research. The question that this research is attempting to respond to is "In what way can training (i.e. in GroenSebenza internship programme) in the first year of an incubation model strengthen the incubants' learning, experience, knowledge, skills and interest to become full participants in their workplace roles and responsibilities in biodiversity occupations?". The research interest is to see how the incubants, mentors, trainers and involved parties experiences evolve within the programme. This question hopes to inform ongoing improvement of the internship training process with reference to how the training could help to contribute to the incubants' full participation in workplace communities of practice. Perhaps this study can also contribute to the choices and retention planning of incubants in the GroenSebenza internship programme.

Should you wish to participate, please could you fill in the questionnaire below.

Your support would be highly appreciated.

Thank you.

Morakane Madiba, Ms

environmental
LEARNING RESEARCH CENTRE

Appendix 2: A questionnaire sent to the GIS incubants in Groen Sebenza project (including the participants of the study).

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Questionnaire 3: Semi-structured Questionnaire for incubants

Name		Preferred-/nick- name (or Anonymous)		Surname	
Organization		Occupation		Mentor	
Gender		Age		Province/town	
Highest Qualification(s)		University/School		E-mail address Tel/Cel no.	
Hobbies		Siblings/cousins you share your home with and how are they supporting you?		Number of dependent(s)	
Who is/are your friend(s) and what do you like about them?				Do you have any external supporting structure/person(s)? Who/How and why?	
Twitter/whatsup/facebook/bbm/mixit/other communicating network and why?		Do you have any working experience (incl. previous internship(s))?		Who is your role model and why?	
Favourite colour and why?		Introvert/extrovert/intermediate and why?		Individual work/teamwork/both and why?	
Favourite place(s) and why?		Favourite meal (and drinks) and why?		Favourite sport and why?	
Favourite TV channel (or radio channel) and why		Favourite animal (s) and why?		Favourite plant (s) and why?	
Someone you dislike and why		Colour you dislike and why?		Place(s) you dislike and why?	
Meal (s) (or drinks) you dislike and why?		Sport you dislike and why?		TV/Radio channel you dislike and why?	
Animal(s) you dislike and why?		Plant(s) you dislike and why?		What is your favourite line/motto and why?	
Amongst the things you hate, what is the one that you despise the most?		Amongst the things you like, what is the one that you love the most?			

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Appendix 3: Interview questions for the incubants.

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Where leaders learn

1. Participant background: Tell me about yourself (interests, hopes, prospects, plans, personal and professional dreams/developments, visions, career path, etc.).
2. What motivated you to apply for the GroenSebenza internship programme?
3. What were your expectations in this GroenSebenza internship programme?
4. What experience, knowledge, skills and interests did you have or bring to the GroenSebenza internship programme?
5. Describe how you were received in the programme and the organization.
6. What are the internship's expectations of you?
7. How is your learning and experience so far? (Do you feel you are given real-work? How are your relationships with your colleagues? How are you contributing to your project or team? How do you find networking, practice, and work ethics? What meaning do you make of your organization logo and mission statement? How did you find the induction week? etc.)
8. What personal and professional experience, knowledge, skills and interests have you gained so far?
9. Have you received any training course? If **Yes**, how was it? (What were your expectations of the training course? What did you learn? Are you able to apply what your leant from training course into your daily tasks/assignments/projects? If not, why not? What can be done to improve the training course?)

   - If **No**, what training course would you like to have?
10. What are your challenges and successes so far and how can you improve them?
11. How does the training contribute / or not to your full participation in your new workplace roles and responsibilities and communities of practice?
12. What do you think can be done to improve your experience?
13. What are your future plans? Has your experience encouraged you to stay in the occupation or within the biodiversity sector? How and why?
14. Can you now identify yourself with the biodiversity field? Do you feel you fit well within the biodiversity field? Why?
15. Is there anything you can tell me that I did not ask?
16. Is there any question(s) you want to ask?

Please could you email the completed questionnaire to madibam3@hotmail.com and if you have questions about the questionnaire please feel free to call me on 0721013055 (and I am also on whatsup).

environmental
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Appendix 4: Letter of request for permission from mentor.

RHODES UNIVERSITY
Where leaders learn

Rhodes University Environmental Learning Research Centre
PO Box 94, Grahamstown, 6140 • Tel:046-603 8389 • Fax: 046-622 8028 • E-mail: [illegible]

8 October 2013

Dear Sir or Madam

My name is Ms Morakane Madiba and I am studying a Masters in Environmental Education with the Environment Learning Research Centre at Rhodes University, Grahamstown. My supervisor is Prof. Heila Sisitka

I am requesting your participation in my research. The question that this research is attempting to respond to is "In what way can training (in GroenSebenza internship programme) in the first year of 2.5 year incubation model strengthen the incubants' learning, experience, knowledge, skills and interest to become full participants in their workplace roles and responsibilities in biodiversity occupations?". The research interest is to see how the incubants, mentors and involved parties experiences evolve as the programme progresses. This question hopes to inform ongoing improvement of the internship training process with reference to how the training could help to contribute to the incubants' full participation in workplace communities of practice. Perhaps this study can also contribute to the choices and retention planning of incubants in the GroenSebenza internship programme.

Should you wish to participate, please could you fill in the questionnaire below.

Your support would be highly appreciated.

Thank you.

Morakane Madiba

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Appendix 5: A questionnaire sent to the GIS mentors in the Groen Sebenza project.

RHODES UNIVERSITY
Where leaders learn

Questionnaire 1: Questions for Mentors

Name		**Surname**	
Tel. no: **Cel. No:**		**E-mail address**	
Organization		**Occupation**	
Gender		**Province/town**	
Course name		**Date and Duration**	

1. Describe your organization/institution's perceptions and understandings about internship programmes. (e.g. meanings, values, cultures, etc., it has adopted)
2. Describe your past mentoring experiences in other programmes.
3. Describe your mentoring experience in the GroenSebenza programme.
4. What does your company hope to achieve from the GroenSebenza internship programme?
5. What are your hopes from this program and your mentee?
6. What are your successes and challenges so far?
7. How is your mentee progressing (personally and professionally)?
8. What support are you receiving in your mentoring?
9. What can be done to improve this programme or your mentee's experience?
10. Is there anything else you would like to tell me about the programme and your experience in it?

Please could you email the completed questionnaire to madibam3@hotmail.com and if you have questions about the questionnaire please feel free to call me on 0721013055 (and I am also on whatsup).

environmental
LEARNING RESEARCH CENTRE

Appendix 6: Informed consent form for the incubant.

Informed consent form

Dear Research Participant

My name is Ms. Morakane Madiba. I am a student doing Master's in Environmental Education at Rhodes University. I am doing a research project which aims to investigate "In what way can training in the first year of an incubation model strengthen GIS incubants' learning, experience, knowledge, skills and interest to become full participants in their workplace roles and responsibilities in biodiversity occupations?" The research interest is to see how the learning, experience, knowledge, skills and interests of GIS incubants, mentors, trainers and other involved parties' evolve within the programme.

My research project will take two years to complete, but the period of your involvement will only be eight months. During this eight month period, I intend to conduct regular interviews with you and will ask that you please write regular entries into a work diary or journal, or include additional entries in the journal system you are currently using.

I am inviting you to participate in this research because I am interested in the GIS community of practice within the GroenSebenza internship programme, of which you form part. Your participation in this research is voluntary and does not promise any remuneration or benefit of any sort to you, but will contribute to better understanding experiential learning in GIS occupations, which may have significance for improving the incubation of interns in this sector in future.

I would like to interview you for one hour. You are welcome to speak in your home language if you feel better able to express yourself in this language. Should you agree/choose to participate, you are still welcome at any time to withdraw from participating in the study without fear of resentment, penalty or negative consequence. It is the intention that participation in the study will bring no harm or risk to you or your job situation. Should any such concerns surface during the course of this study, these will be treated with the utmost care and importance, and legitimate and ethical procedures will be followed towards resolution. In support of this arrangement, a formal letter of permission must be written by your organization to confirm their support of your participation.

In regards to confidentiality and anonymity, you can be assured that nothing you say or contribute will be used or displayed in such a manner contrary to your wishes. Should any information or anecdotes arising from your participation be requested for re-use either by someone outside of this research project or the Rhodes University institution, your permission will always be requested in advance.

In this study you will be quoted under a pseudo-name. All data and transcripts captured from our interactions will be stored in a safe, private and secure place, and will only be accessed by the research team members.

A tape recorder be used to document all interviews as part of the research process. This is viewed as necessary to capture accurately the interactions and to enable thorough revisiting of the interviews for effective analysis.

You are welcome to ask any question at any time about the study. After our time working together has concluded, I will analyse and write-up findings emerging from your contributions. I will share these findings with you and we can discuss any response, ideas or concerns you might have.

I……have read and understood the above conditions relating to participation in this study, and agree to participate fully to the best of my ability.

Appendix 7: Plan of first round of data collection. The plan shows my availability so that if the participants cannot make it on the scheduled date they can always refer to this plan to make re-appointments.

Days	Date	Organization	Time : Participant	Contact details
Monday	18th November 2013	SANBI	10:30 – Mentor: Ms. Thoko Ngubeni 13:00 – GIS incubant: Mr MacD Zondo	t.ngubeni@sanbi.org.za (012 843 5298) m.zondo@sanbi.org.za (078 046 1234)
Tuesday	19th November 2013			
Wednesday	20th November 2013		Depart to Limpopo	
Thursday	21st November 2013	LEDET	10:30 – Mentor: Mr. Treve Jacksons 13:00 – GIS incubant: Ms. Tumi Dikeledi	jacksont@ledet.org.za (082 412 1234)
Friday	22nd November 2013	LEDET	10:30 – Trainer and Manager: Mr Kevin Lotz 13:00 – GIS incubant:	Lotzk@ledet.org.za (082 806 1234)
			Return from Limpopo	
Saturday	23rd November 2013			
Sunday	24th November 2013			
Monday	25th November 2013			
Tuesday	26th November 2013			
Wednesday	27th November 2013			
Thursday	**28th November 2013**	**SANBI**	**Groen Sebenza Training task team meeting**	
Friday	29th November 2013			
Saturday	30th November 2013			
Sunday	01th December 2013			
Monday	02th December 2013	ESRI	10:30 – Mentor: Ms. Sofia McKenzie (or Ms. Lina van der Walt) 13:00 – GIS incubant: Ms. Tintswalo Simango	smckenzie@esri-southafrica.com/ lvanderwalt@esri-southafrica.com (011 238 6300) (079 962 1234)
Tuesday	03rd December 2013	ESRI	10:30 – GIS incubant: Ms. Lebo Ndaba 13:00 – GIS incubant: Ms. Mosidi Seome	(072 064 1234) (079 991 1234)
Wednesday	04th December 2013			
Thursday	05th December 2013			

Friday	06th December 2013			
Saturday	07th December 2013			
Sunday	08th December 2013			
Monday	09th December 2013			
Tuesday	10th December 2013			
Wednesday	11th December 2013			
Thursday	12th December 2013			
Friday	13th December 2013			

Appendix 8: Example of the interview transcript.

Tso

MK: Is there any question you would like to ask before we start?

TT: How did you find about GS?

MK: I was an intern at SANBI...and did some networking there....and that is how I knew about it....and how I got involved?...I got a bursary from CATHSSETA through Rhodes University.....CATHSSETA in a nutshell is responsible to foresee the internships occurring in the environment sector....and then I was asked about the things that interest me that I would want to study about....and the first thing came to mind was the 'internship(s)' due to my background of having been in few internships in the biodiversity sector... At that time the GroenSebenza project was an opportunity to study/investigate because it is perceived as different from any other internship amongst other factors it is because it takes 2.5years period as opposed to one year period that I was used to...also my experience in internships contributed a lot in wanting to research it....To understand GS more I was introduced to the GS team and fortunately I was appointed as one of the training task team ..... that is briefly how I got to be involved....

MK: anything else

TT: No

MK: then we can start.....maybe we should start by... you explaining/describing to me on what motivated you to apply for GS?

TT: just like any unemployed graduate.....i studied geology and majored in environmental....with UKZN....so I was unemployed for about 9 month and that point I was not keen to go to the mining industry because of all this strikes and chaos...so I really got interested in getting into environment sector...then I saw the advert of GS and they wanted someone with environment background...i did environment sciences and GIS...and I thought let me try....when I got there it became interesting...

MK: how was it interesting?

TT: like here GS, is not like any other internship...you get exposed to a lot of things especially with DEA... because we are doing businesses...I can be flexible and...i have learnt a lot

MK: how was your experience at DEA different from ESRI?

TT: at DEA mostly we were just attending seminars-sustainable development...so here at ESRI, that is where we got to do GIS.....also at DEA we attend financial business learnership and attend all seminars to be exposed to green economy and opportunities in it....but here at ESRI it's totally GIS

MK: how is it so far?

TT: it's good...we are receiving a lot of training...and I can see that I'm getting there

MK: what kind of training and what did you learn?

TT: I think so far I have done 5 training courses....basic GIS, standard GIS, advanced, remote sensing

Appendix 9: This is an example of how I colour coded the copy of the original transcript. I used colours not for a particular theme but rather I coloured phrases that were going to be placed in the possible category or theme (i.e. column) in the Microsoft excel spread sheet shown below. This helped me to see the information that I had not used.

McD: I use GIS software and it is provided by SANBI ...and it is my basic tool I use everyday to do my work...

MK: how do you plan your days?

McD: I have a schedule....firstly I write reports every month...so by writing reports have helped me to plan/create my daily tasks...that has helped to organise and structure my work...and I can trace my work every week

MK: within the programme what are your concerns and successes.....what can be done to improve?

McD: Lots of training.....that's what can this program can do for me.....a lot in the environmental side....different divisions under environment especially those that are related to what i am currently doing

MK: how would you rate your competence and confidence so far?

McD: mm...I've gained a lot of confidence...what made it possible is that I have a good motivational mentor...and she is exposing me to so many things for instance, presentations which boost my confidence....additionally I (my work) have contributed to the inventory page....those are some of the key things that really help me in my building my confidence

MK: how are your interactions with your colleagues and mentor?

McD: interaction meaning relationship?

MK: well....ya

McD: I have very nice colleagues....we sit and chat about many things like work stuff, our concerns...

MK: who are they?

McD: they are other incubants and .....others are full time employees which we started together in the NRF internship

MK: And interactions with your mentor?

McD: It's positive.....when there is a lot of work...we strategize (sit down) our work especially when we are under pressure so we can avoid to step on each other's toes....we do have a way of solving things when we are under pressure because there is few of us in our division (-and the workload is a lot -)....

MK: what kind of pressure do you usually have?

McD: deadlines....having lots of work within a small space of time....we never had a problem of submitting things late....we do have a way of solving problems...so ya we do have a good relationship...we know when to chat and when to do the actual work...and we don't only talk about work staff but also we talk about other things...that's how good our relationship is...

MK: how is your culture here in SANBI? The people you spent time with, during lunch, communication, etc.?

Appendix 10: This is what the codes looked like in a Microsoft spreadsheet.

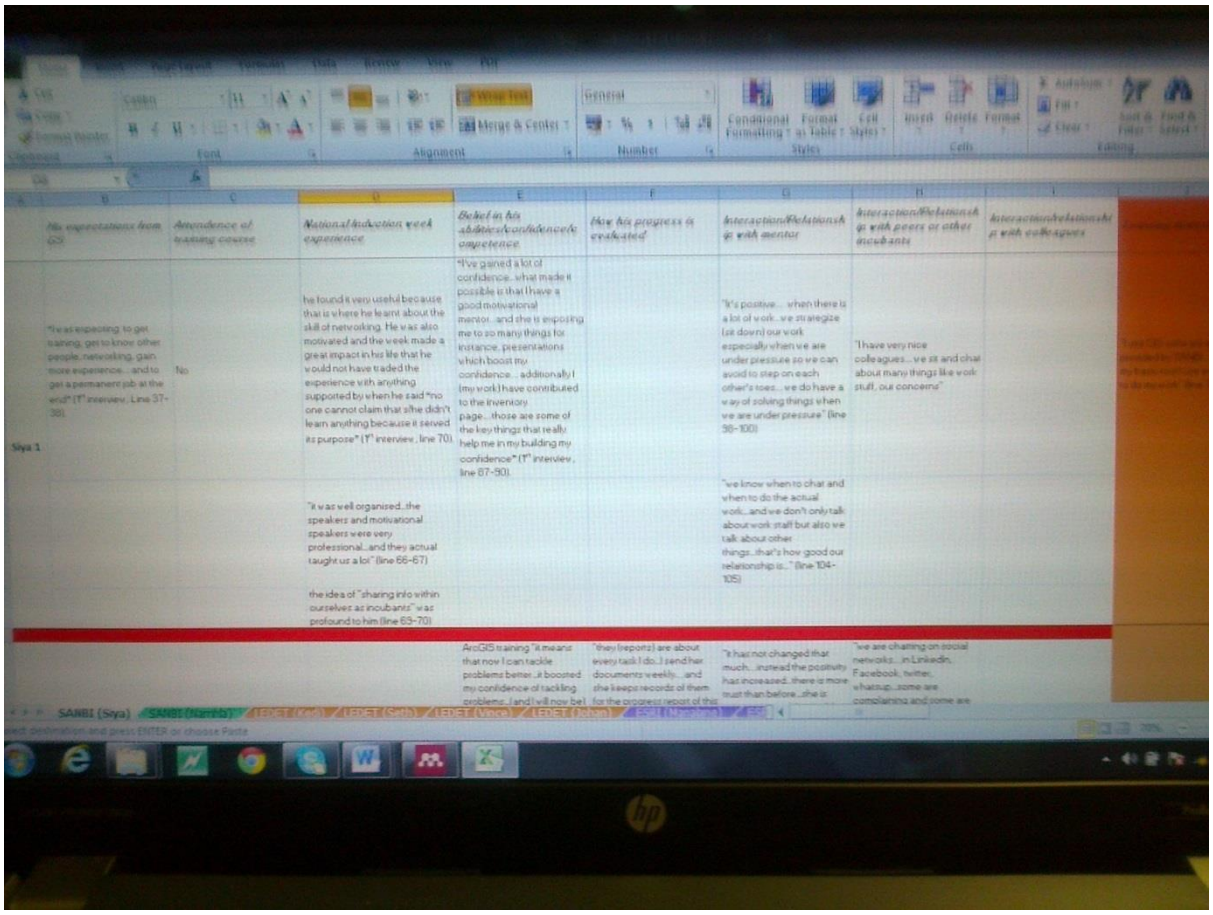
	His expectations from GS	*Attendance of training course*	*National Induction week experience*	*Belief in his abilities/confidence/competence*	*How his progress is evaluated*	*Interaction/Relationship with mentor*
MacD 1	"I was expecting to get training, get to know other people, networking, gain more experience….and to get a permanent job at the end" (1st interview, Line 37-38).	No	he found it very useful because that is where he learnt about the skill of networking. He was also motivated and the week made a great impact in his life that he would not have traded the experience with anything supported by when he said "no one cannot claim that s/he didn't learn anything because it served its purpose" (1st interview, line 70).	"I've gained a lot of confidence…what made it possible is that I have a good motivational mentor…and she is exposing me to so many things for instance, presentations which boost my confidence….additionally I (my work) have contributed to the inventory page….those are some of the key things that really help me in my building my confidence" (1st interview, line 87-90).		"It's positive…..when there is a lot of work…we strategize (sit down) our work especially when we are under pressure so we can avoid to step on each other's toes….we do have a way of solving things when we are under pressure" (line 98-100)
			"it was well organised…the speakers and motivational speakers were very professional…and they actual taught us a lot" (line 66-67)			"we know when to chat and when to do the actual work…and we don't only talk about work staff but also we talk about other things…that's how good our relationship is…" (line 104-105)
			the idea of "sharing info within ourselves as incubants" was profound to him (line 69-70)			

MacD 2		He attended the ArcGIS standard training at ESRI, Midrand and obtained a completion certificate and gained six credits which is accredited by SAQA for GIS.		ArcGIS training "it means that now I can tackle problems better…it boosted my confidence of tackling problems…(and I will now be) finding myself doing deep challenges…because I learnt a lot about problem solving…a lot actually…another thing is that I learnt new tricks rather short-cuts about GIS applications and I am going to apply…actualy I have already started applying on the work that I am currently doing daily….i have gained a lot" (line 11-15)	"they (reports) are about every task I do…I send her documents weekly...and she keeps records of them for the progress report of this project… also to be able to assess how much we have covered and how much work is left and how much time left...then she calculate the possibilities of finishing the work left within the time prearranged…" (line 157-160)	"it has not changed that much...instead the positivity has increased…there is more trust than before…she is trusting me and the work I do…I am also showing her that I am doing my work very well….that is why she trusts me….as a result I have lots of freedom…so I do my work alone…and only submit the data and alert her on my progress…when we get time we brief each other and update each other in an informal setting and usually is verbally" (line 51-55)
				"that change (chasing deadlines and the workload piling up) had added a lot of pressure…but yeah…I am a fighter…it is not a problem to me…." (line 60-61)		
	Her expectations from GS	***Motivation to apply for GS internship***	***Attendence of training course***	***National Induction week experience***	***Her interests***	***Things that the incubant learnt***

Tumi 1	"obviously an internship is a place where you get training…when you are out of varsity you have no working experience…so when you get an internship you are expecting to get more knowledge in that field and practical work…that's the main expectations for me that I learn something (such) as GIS technician" (line 16-19, pg 1)	Well….i completed 2011(with Wits) and graduated 2012 in June...and then I was looking for a job…as I told you that I did two majors geography and geology...so I didn't find a job in geology sector…but I did something part time but it wasn't hectic geology stuff….it was just basics…that's what I did from last year (2012) July until this year (2013) June….and all this time I was unemployed…and I applied 4 GS GIS post...it was January this year 2013…because I was applying for both geology and GIS...when I saw the post I was like let me try this GIS thing…obviously I didn't have much experience in the environmental	Not GS training course...the one we had was organised by Vince but it was a three day course about statistics it doesn't really focus on GIS so I wouldn't really call it the main training we need		"though my main goal wasn't to be in this sector…but over the past few months I sort of grown and loved this kind of environment like the whole thing about biodiversity and conservation…but I mean I did geology and that was my passion…that's what I wanted rocks (as she speaks of geology her face was glowing and you could feel her passion in her tone)…but now I see things differently…and I'm like well okay" (lines 161-165, pg 2)	"in terms of GIS I learnt a lot from the day I got here until now….you know when you are at school it's just the basics, you don't really go deep and think things through…ever since I came here I learnt so much…I learnt to create geodatabase which I didn't know before…I also learnt how to work with raster...you know this thing of vector and raster in GIS….editing and digitising images-I have learnt all that from here…I think it's been great, my knowledge has grown even though I think it could have grown more if we had resources" (lines 92-97, pg 2)

		sector per se…what we did was basically modelling …basic background of conservation…..but I was like this is something I can do and I have passion for GIS and environmental sector is one of the interesting things (to pursue a career)…ok I was like let me try it and see how things will go….and then I got interviewed in March since then I never heard anything from them….but in the meantime I was doing my part time project…I think 1st of July they called me to say I got the internship.				

Appendix 11: This is what the coded data looked like on the Microsoft spreadsheet.



	His expectations from GIS	Attendence of training course	National induction week experience	Belief in his abilities/confidence/competence	How his progress is evaluated	Interaction/Relationship with mentor	Interaction/Relationship with peers or other incubants	Interaction/relationship with colleagues
Siya 1	"I've as expecting to get training, get to know other people, networking, gain more experience...and to get a permanent job at the end" (1st interview, Line 37-38)	No	he found it very useful because that is where he learnt about the skill of networking. He was also motivated and the week made a great impact in his life that he would not have traded the experience with anything supported by when he said "no one cannot claim that s/he didn't learn anything because it served its purpose" (1st interview, line 70).	"I've gained a lot of confidence...what made it possible is that I have a good motivational mentor...and she is exposing me to so many things for instance, presentations which boost my confidence... additionally I (my work) have contributed to the inventory page...those are some of the key things that really help me in my building my confidence" (1st interview, line 87-90).		"It's positive... when there is a lot of work...we strategize (sit down) our work especially when we are under pressure so we can avoid to step on each other's toes... we do have a way of solving things when we are under pressure" (line 98-100)	"I have very nice colleagues...we sit and chat about many things like work stuff, our concerns"	
			"it was well organised...the speakers and motivational speakers were very professional...and they actual taught us a lot" (line 66-67)			"we know when to chat and when to do the actual work...and we don't only talk about work staff but also we talk about other things...that's how good our relationship is..." (line 104-105)		
			the idea of "sharing info within ourselves as incubants" was profound to him (line 69-70)					
				ArcGIS training "it means that now I can tackle problems better...it boosted my confidence of tackling problems...(and) I will now be	"they (reports) are about every task I do...I send her documents weekly... and she keeps records of them for the progress report of this	"It has not changed that much...instead the positivity has increased...there is more trust than before...she is	"we are chatting on social networks... in LinkedIn, Facebook, twitter, whatsup...some are complaining and some are	

Appendix 12: This is a stage where I gathered all views from all participants about a particular theme together and looked for trends.

	THE INCUBANT'S LEARNING PROGRESS(PROFESSIONAL AND PERSONAL GROWTH)
Thoko 1	"he is learning how the project functions and what the unit is trying to achieve…so he is been able to be on his own in conferences and networking, and come back with a good feedback …he presented a poster at the wetland indaba…..so he is learning" (line 61-63, pg 2)
	"i think he has been fine and he is learning….he is growing his skills by serving on the internet to understand the tools in GIS without me telling him what tools to use" (line 67-69, pg 2)
	"at times they know if they can't get hold of me they can get GIS support from MacD…and that shows a certain confidence rating….and he can even assist with administration things….I don't always have to be physically there" (line 181-184, pg 5)
	"I don't know…..I'm not that much of an assessor of personal growth or even people personalities" (line 73-74,pg 2)
	"but from just giving responsibilities I think he still has a long way to go/grow…in taking that accountability…like if a person need to be reminded about taking notes in a meeting, like if the debate is heating in the room and you are (mentor) participating and the incubant is not taking notes…those are the things I think are based on personal growth…ehm responsibility of when we have a meeting or workshop….clearly your mentor does not have time to check the attendance register….it should become automatically to an incubant if he has grown personally, (to consider) that those things are part of his job" (line 74-80, pg 2)
Thoko 2	he is doing well…I think…because the month that we have been working together... ehm…the understanding that he might have gained in the period that we have been working together….he is getting there...he is able to be independent" (line 4-6, pg 1)
	"you don't need to start a new intern now and again…for instance now when we get the intern from NRF [12 months internship], MacD will be the one who will work more closely with that intern without me needing to be there because of the investment of having spent so much time with him" (line 54-57, pg 1)
	"taking for instance things like presentations…and all that…i don't have to cover his questions…he is able to answer and handle his Q&A sessions….hence I think skills are being transferred" (line 60-61, pg 1)
	"he [MacD] gets to be called into other projects within our unit [department] in my absence sometimes…he went away with my colleague, John, the other time to the ecological infrastructure meeting… (the only thing we did before his departure)we only did briefing on how to do maps for Tshwane and other stuff…and with de feedback I got from him it was nice" (line 69-73, pg 1)
	"it's good and at the same time bad… and he is…when I'm not trying not to be there, to be part of the conversation and looking the other way…he participates well….he speaks with a soft voice…and his confidence for presentations has not been that good…but he did well in his presentation INDABA and did well in his interview with Radio 2000" (line 32-35, pg 1)..PARTICIPATION
Treve 1	Tumi is really committed and she show up….I think she will be very good actually" (Line 60-61, pg 2)
	but I think I also recognised that they know more of the technical aspect of GIS because they working with ESRI [products] and we also have ESRI services set up for them….what we are basically sitting with" (line 89-91, pg 3)

	but Tumi is very efficient and focused and talks quickly, you will know where she stands all the time…..and she is also a person who jumps into the internet to find a solution by herself before she comes to ask…. So there is a spark there…and I'm happy with it... but I'm not saying Seth has not got the spark ….but he is very difficult to get…..but what I have seen so far from him is that attitude of "take your open source and play somewhere else because I have arrived" …. " (line 116-121, pg 3)
Treve 2	Seth has now submitted his application to be registered with the GIS body, PLATO ….so he has already on the waiting for the feedback I think…so he is on a root already… and I think he has a bit of experience previously…. I think he was at the premier's office at department of agriculture…so he has quiet of de experience to use there…and that's quite an easy step for him… also he studied geography and GIS direction whereas Tumi is more of broader geography and geology
	what I am seeing with our interns generally is that if you live them alone for too much you will inevitably going to end-up with problems in terms of direction and so on

Appendix 13: The first itinerary proceedings of the Incubator task team.

SANBI Biodiversity for Life
GROEN sebenza a jaars fund partnership

MEETING INFORMATION			
SUBJECT/TITLE	SANBI GROEN SEBENZA PROGRAMME		
DATE	28 November 2013	VENUE	Biodiversity Auditorium , Pretoria
KEY OBJECTIVES	To discuss and finalise matters relating to the core functions of the Incubator Task Team		

AGENDA for INCUBATOR TASK TEAM MEETING

MEETING PARTICIPANTS	
MEMBERS	Incubator Task Team Members: Rachel, Vuyo, Raylene, Morakane, Linda, Donavan, Vivian, Eureta
APOLOGIES	Dudu, Presha, Alison, Michelle Hamer
PREPARATORY DOCUMENTS	As indicated below.

MEETING AGENDA					
ITEM NO.	TIME	TOPIC	REF.	DESIRED OUTCOME	LEAD
1.	09h30-11h00	Mentor Engagements	Presentation	Feedback and way forward – dates for next training and approach.	Rachel Balie
TEA/COFFEE					
2.	11h30-12h30	National Training for Incubants (Communication and Networking; Quarterly Performance assessments)	Presentation	Finalisation of the ToR for the training and discuss focus, envisaged outcomes, approach/ model of implementation, logistics. Way forward with performance assessments.	Vuyokazi
LUNCH					
3.	13h45-14h30	2nd National Induction week	Draft Programme and resources	Finalise the programme and resources required.	Donavan
4.	14h30-15h30	Policies (Rotation and Retention; Bursary)	Policy documents	Final input and finalisation.	Donavan
5.	15h30-16h00	Task Team lead		To make a decision about the lead and way forward.	Donavan
6.	16h00-16h30	Other matters			All

INCUBATOR TASK TEAM MEETING AGENDA