# CHAPTER FIVE

# CASE STUDY PARTICIPATORY ACTION RESEARCH CYCLE TWO

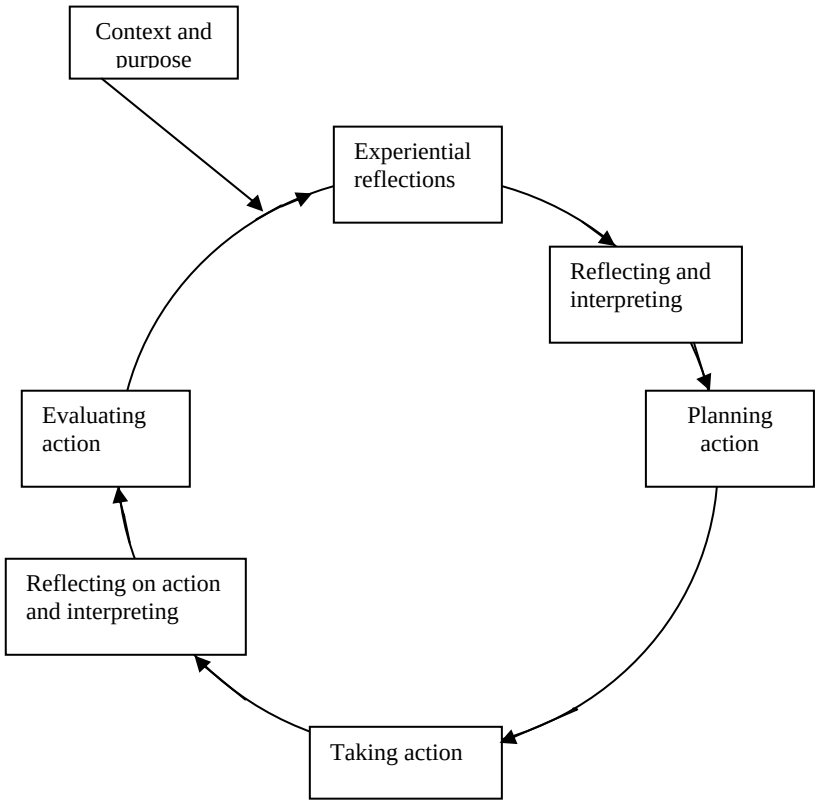
## 5.1. Introduction

The purpose of this chapter if three fold: first it hopes to present the sequence of this cycle in relation to the other three cycles, observed in Table 8 (see shaded area). Second it presents the case study participatory action research cycle model used, as observed in Figure 2. Finally it describes the data analysis process and presents the analysed second level data in the form of themes for each of the steps in the cycle and conclusions are reached.

Table 8: Sequence of cycles

| Action research cycle one | Action Research cycle two | Action Research cycle three | Action Research cycle four |
|---|---|---|---|
| Weeks one, two and three | Weeks four, five and six | Weeks seven to seventeen | Weeks eighteen to thirty-nine |

Figure 2: James model for cycles one and two




## 5.2. Context and purpose

### 5.2.1. Context

Cycle two occurred during the fourth, fifth and sixth week of the programme. The context for this cycle was the university. The participants in this cycle were the student teachers, the specialisation lecturer and the researcher.

### 5.2.2. The main purpose of cycle two

The main purpose of cycle two is divided into two dimensions. Firstly, it was designed to establish and challenge the students teacher's phronesis - now renamed a practice theory, and secondly to challenge the student teacher's practice theory against the professional dimensions of facilitating learning in the Life Sciences. In terms of the first dimension, the purpose had to do with ascertaining each student teacher's commitment to facilitating

learning in the Life Sciences as a worthwhile pursuit. To achieve this, the teacher educator had to ask student teachers to answer the question: Why do you want to facilitate learning in the Life Sciences? The other aspect under the first dimension had to do with the researcher challenging each student teacher's already constructed practice theory through a question already posed in the first cycle. The response required in this cycle is a visual presentation as an answer to the question: What is your perception of your role as facilitator of learning at this point in time? Answers to this question are also to be explored for a better understanding of the student teachers practice theory construction.

To achieve the purpose of the second dimension, the researcher had the challenge to ascertain the validity and viability of student teachers' practice theory regarding the nature and structure of the Life Sciences. To achieve this, the teacher educator had to ask several questions after the students had studied three documents: The Study Guide of Facilitating Learning in the Natural Sciences and Technology, Biology Education - A Reader, and The National Curriculum Statement for The Life Sciences Grades 10-12. Answers to these questions were explored for better understanding of the student teachers' practice theory construction.

### 5.3. Step 1: Experiential reflections

During a semi-structured interview each student teacher was asked to share their reasons why they decided to become Life Sciences student teachers and to draw how each saw himself/herself as a Life Sciences facilitator of learning. Each student teacher was then interviewed and asked to interpret the drawing. This was done as the beliefs that the student teachers have about their role as facilitators of learning will influence their

perceptions and judgments, which in turn, will affect their behaviour in the classroom (Peterson, *et al*, 1989; Pajares, 1992). A detailed report of the descriptive data collection process, the data analysis process and the descriptive data are presented in the appendix 1 section II – cycle two in the DVD. The analysis process of the descriptive data and the emergent themes are presented in 5.3.1. and 5.3.2. respectively.

### 5.3.1. Data analysis process

This descriptive data consisted of a short story where the student teachers shared their reasons for wanting to become Life Sciences student teachers, drawings of how each saw his/her role as a facilitator of learning. These stories were read and then relationships between the categories were made and themes developed from this. The drawings and the stories were used to reveal the student teachers' perceptions of teaching and learning. Leavy, Mc Sorley & Bote's (2007) data analysis tool was used to classify the student teachers' into particular categories of teaching and learning based on their perceptions and beliefs about teaching and learning.

### 5.3.2. Themes

*5.3.2.1. Reasons (decision) for becoming a Life Sciences student teacher*

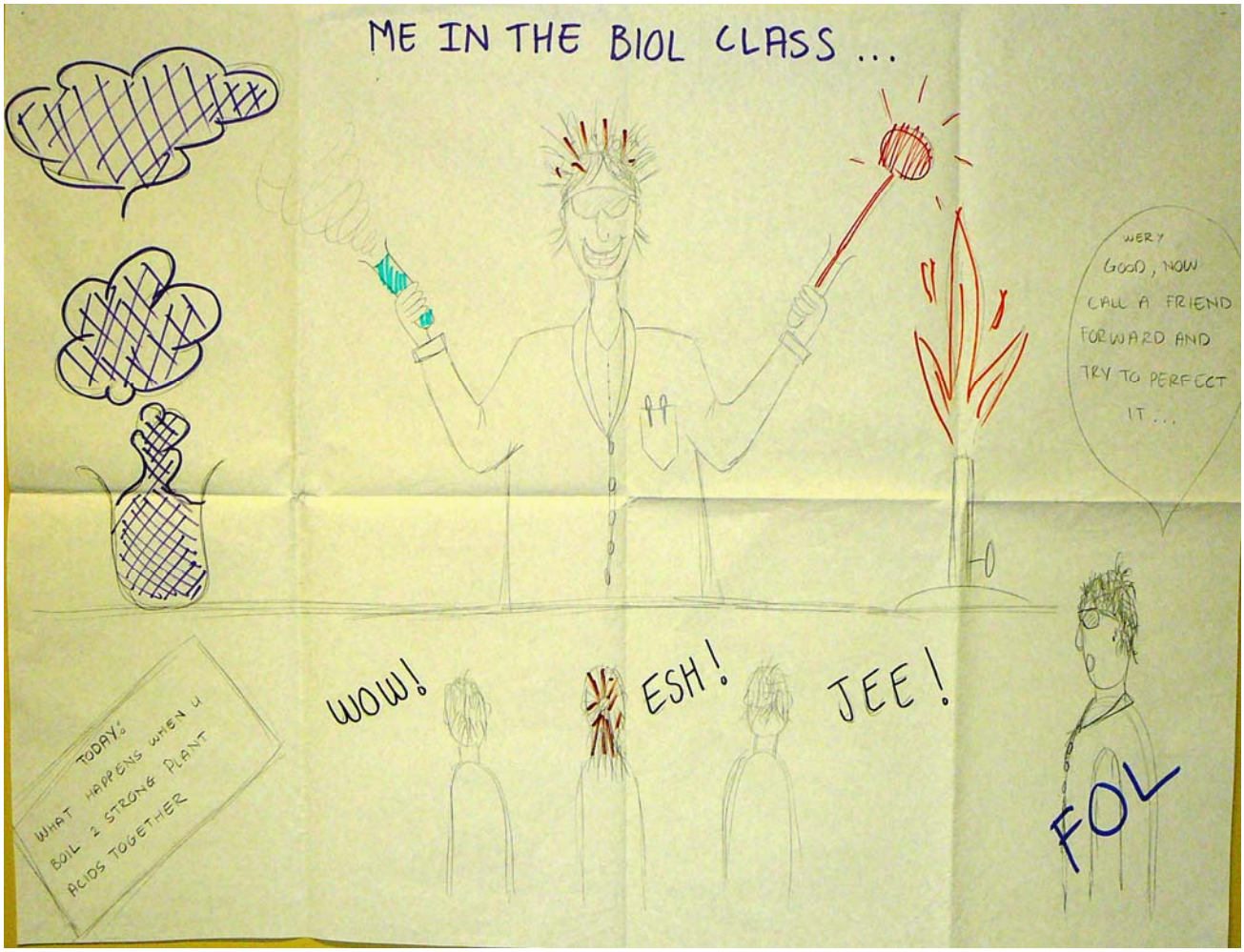
Bernice's decision for becoming a Life Sciences student teacher was influenced by different factors. First, she came from a family of teachers: her "grandfather was a professor of Mathematics and my mom went into the Mathematics world." Bernice's experience of being taught by an amazing Physiology lecturer had a major impact on her decision to choose to be a teacher in that the kind of work she "explained to us made me excited to go into teaching." Bernice realised from teaching horse riding to small children that "the small kids are fun" to teach. She then decided that "the idea of working with children in the way that you can express your subject but you can also make a difference in

childrens' lives". Hence, the area for her to go into "was teaching for me." Carol's thinking about teaching, on the contrary, was influenced by a childhood wish of wanting to work with people. She stated that "as a little girl teaching was there … I always thought I would not mind becoming a teacher and I thought that I would enjoy it". This thinking was formalised as a decision when she taught at Saturday school where she "started to think I can do this for life and this is where my passion started for teaching." She stated that "the Saturday school was the 'spuit op die kop' (the nail on the head) – that was it for me." This experience revealed to her that she "was a patient person" that could teach. Mack's decision to teach was influenced by his interest in teaching and his passion for nature. Mack's decision to teach started off at "church where I have led youth groups for a long time" and also that he had "always been interested in teaching people things." Mack also stated that he had grown up on a farm and has "always enjoyed nature – have a great passion to conserve it". Mack concluded that "children hold nature's future in their hands … I can help them to see the beauty of nature." He stated therefore that the "only way to teach my students about the enjoyment of nature was through Biology/Life Sciences."

*5.3.2.2. Student teachers' views of themselves as facilitators of learning*

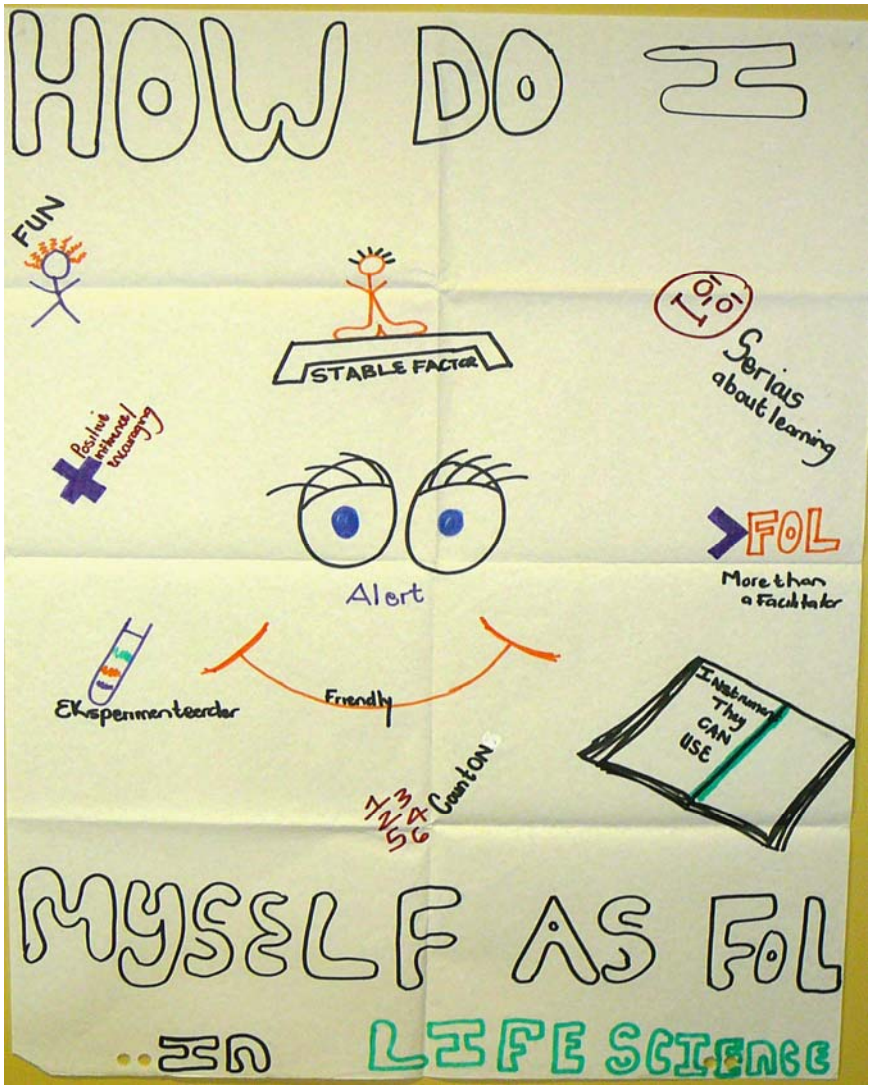
Bernice saw herself as a supportive person who guided the learners by "walking through the class and watching them as they try things out [and] assessing what they are doing" and monitoring time. She thought that a facilitator of learning should give positive comments to learners and not say that something is wrong. For her, this "could suppress their [learners'] confidence." Her supportive role is further evidenced by the fact that a facilitator of learning should say to learners "no it's fine, but just try it again or try until you get it right." She concluded by stating that "I am all for practical work, so they are doing the hands on experiment". Bernice explained that she put herself on the side as she was "observing the learner demonstration with the other learners. Based on the analysis of her drawing Bernice

was placed into the constructivist and learning situative category as developed by Leary et al (2007). This was because her learners were actively involved during the lesson and the learning was taking place in the laboratory.



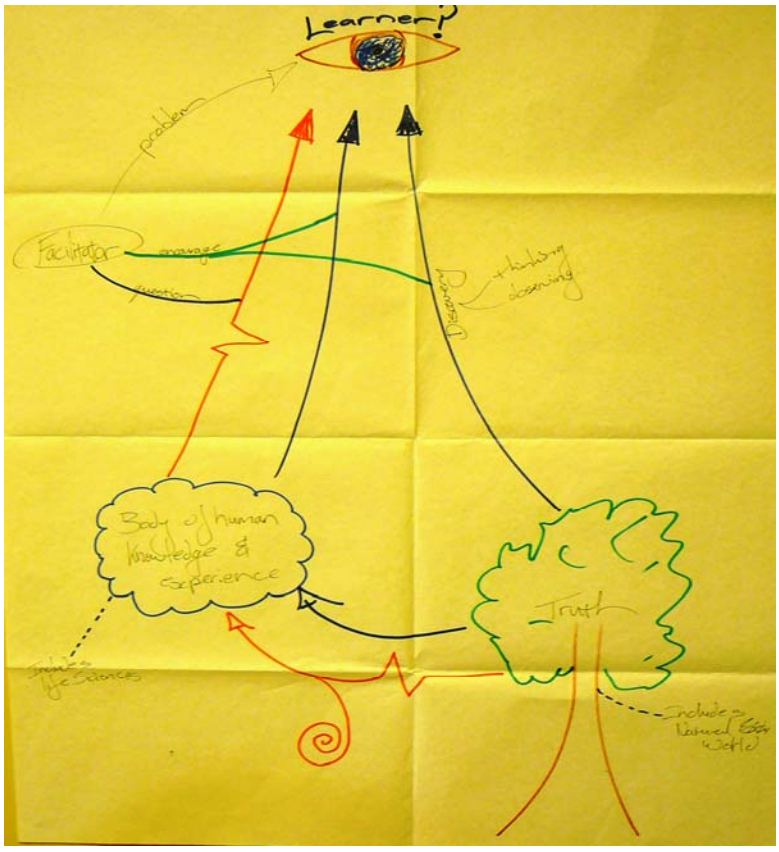

Drawing 1: Bernice's view of herself as a facilitator of learning

Carol described herself as a friendly and alert person who provided fun but was "a stable factor in the classroom". Carol thought that she would get "more out of the children by not being their friend but by being friendly." She also saw herself as providing "motivational aspects for the learners, being a positive influence, encouraging and someone that they could confide in." She did say though that she was "especially serious about the learning, making sure that they understand and that they have what they need". Carol's role captured a number of different aspects that she thought were important for her to do for the learners' learning process to be enhanced. Carol on analysis of her drawing was placed into the self-referential category because she refers to herself and all the activities that she will be involved in with minimal reference to learners.




Drawing 2: Carol's view of herself as a facilitator of learning

Mack viewed himself as a facilitator of learning whose role was to check and correct, and motivate the learners. He was interested in checking the "knowledge that learners have as I do not want them getting incorrect truth." He also viewed it as "crucial in the learning process in that he had to establish inquiring minds in learners and make them realise that what they believe in, is not the truth." He was aware of his role when he stated that "you as a facilitator intend or try to get them to answer the questions, therefore they have to observe things and in doing this they have to acquire things in order to solve problems." He also stated that to get the learners to start thinking about something "they need someone who can encourage them when they are on the right track or when they are establishing the truth coming out and question them if you see something wrong". Mack used the eye (in his drawing) to symbolise the learner. The reason he gave for this was that "I think cause that is what symbolically you want to do, to open their eyes to the world around them." Mack on analysis of his drawing was placed into the behaviourist category. This is because it is focused on what he is going to do with learners.




Drawing 3: Mack's view of himself as a facilitator of learning

*5.3.2.3. Student teachers' views of learners and learning*

Bernice used the words "wow, is it, geeh", in her drawing to show that "the class is actually amazed. They are not sitting looking out the window or something; they are amazed at what their friend is doing." She explained that the children sitting and watching "would want to go up front and try it themselves." Bernice stated that the learners were "doing this experiment, they are learning." Bernice explained that she wanted the children in her class to "learn through experimentation - not just with test-tube experimentation but even in their theory." The reasons that she gave for this were that "learners are afraid of the whole, afraid of exploring and afraid of practical work … [and] Biology is a practical thing." She wanted the learners to have "fun [while experimenting and] to have confidence, to try things, to try new things, because when you have confidence to try things, then you also have confidence to pose questions to yourself and also to your facilitator of learning." Carol viewed her learners as individuals who would be "serious about learning and fun would be an important element of this learning." Mack on the other hand believed that the learners can experience the world by using their senses to answer questions that they have or to solve the problem given to them by the facilitator of learning. In order to do this, the learners have to acquire knowledge. Through the questioning and through giving them a problem, placing a problem in front of them, this gets the learners to question." He represented this questioning action of the learner by a question mark

## 5.4. Step 2. Reflecting and interpreting

This step focused on the data captured from the group discussion interviews during the reflection specialisation discussion sessions. The data was analysed to give meaning to the student teachers' construction of a practice theory. The data focused on the student

teacher's perceptions of a facilitator of learning. Responses that indicated each student teacher's perceptions of a facilitator of learning and self identity were selected. Also responses that reflected the actions that enhanced the student teacher's professional development were selected. These responses were presented as interpretations and linked to questions called factors. These responses were selected as the importance of the self with regard to perception and the development of a student teacher as an authentic being (Barnett, 2004). Since the consensus between different cognitive structures of individuals has to be activated the session was held in a group setting (Wortham, 2001). A detailed report of the data collection process, the data analysis process for the descriptive data and the descriptive data are presented in the appendix 1, section II – cycle two in the DVD. The analysis process of the descriptive data and the emergent themes are presented in 5.4.1. and 5.4.2. respectively.

### 5.4.1. Data analysis process

The descriptive data was further analysed. The factors identified were induced from the data and the theoretical framework was used to inform these.

### 5.4.2. Themes

*5.4.2.1. The specialisation discussion sessions provided the spaces for the student teachers to construct their phronesis.*

It was during these sessions that the student teachers were asked to share a visual of how they saw themselves as facilitator of learning and their reasons (decisions) for their choice of a teaching profession. During this time their phronesis was further explored and it was during this exploration that they became aware of the roles of the facilitator of learning in terms of their personal and public dimensions.

According to the Vygotskian perspective, this principle is used to shape the process of professional development in which personal ideas and motives can find valid public expression (Van Huizen *et al*, 2005, p. 275). The student teachers are given an "exploratory space" (*ibid*) to make and follow up personal choices for teaching.

Bernice's choice for teaching was based on historical connections such as being taught by an amazing Physiology lecturer and her interest in teaching children. Carol's, on the other hand, was based on her interest in children and her amazing experience of teaching Saturday school. Finally, Mack's choice was based on his interest in teaching people things and his passion to conserve nature.

*5.4.2.2. Strategies to reveal and challenge student teachers' beliefs*

The understanding of the development of a facilitator of learning is based on both personal and professional aspects. Personally meaningful images of teaching for Bernice were that she saw herself as a person who did various things for learners. Mack, on the other hand, due to his strong Christian belief saw himself as the person with the truth.

In terms of Bernice's case, the professionally meaningful images of a facilitator of learning were revealed. She wanted to provide learners with a fun learning context and the confidence and encouragement that learners required. Her perception of her role as a facilitator of learning, however, was challenged. This is evidenced from the statement that she made: "I thought that it would be me doing the experiment" (comment about the main person in the picture). She changed the statement and said that it was a learner doing the experiment. The internal conflict that Bernice experienced was an indication of the fact that she was going through a change process in her thinking about the role of a facilitator of learning. She was also establishing reasons/underlying assumptions about her role as a

facilitator of learning and how children learn. Carol's professional image revealed the multiple roles that she wanted to play as a facilitator of learning. She saw herself as friendly, alert, a stable factor in the school life experience of the learners and more than a facilitator of learning. This is because she saw herself as serious about learning and understanding. She still wanted to provide fun for the children. Carol also saw her role as including motivational aspects for the learners where she could be a positive influence and encouraging to the learners. Her view of herself as a facilitator of learning was in a broad educational sense with regard to her developing her knowledge about the curriculum and curriculum change. She used a play of words such as can and not must, when she was describing what she would do as a facilitator of learning. This illustrated her awareness of the social aspects of a facilitator of learning and the power relationship between 'teachers' and learners. This power relationship was supported by Carol not wanting to be seen as having all the power in the facilitator of learning - learner relationship. This thinking lends itself to the behaviour necessary for an effective facilitator of learning. Mack was focused on developing the truth in learners as he "wanted to encourage the learners to achieve the truth." This truth is viewed as the content of the subject.

*5.4.2.3. Learning from emotional experiences*

Each student teacher experienced various emotions: from exploring reasons for wanting to teach and also the roles of a facilitator of learning. Bernice stated that sharing her story was a "nice experience." Carol, on the other hand, felt "challenged" by the drawing activity as she struggled to think up things to represent it outwards for it to be seen. Mack, on the contrary, stated that he felt good about sharing his story as what he saw in it was his passion for teaching and for really helping other people.

## 5.5. Step 3: Planning Action

This step was concerned with planning for the elicitation and exploration of the student teachers' interpretation and perception of the Nature and Structure of Life Sciences and the South African schools implementation policy for Life Sciences (Grades 10 – 12). The specialisation lecturer gave each student teacher documents: The Study Guide of Facilitating Learning in the Natural Sciences and Technology, Biology Education – A Reader, and the National Curriculum Statement for the Life Sciences Grades 10 - 12readings – Biology Teaching – an information manual by Schwab; Natural Science and Technology Booklet and the National Curriculum Statement - Life Sciences Policy document. The students were given a few days to read and interpret the content in these documents with a view to constructing their knowledge about these particulars aspects of Life Sciences.

## 5.6. Step 4: Taking Action

The action step focused on four specialisation discussion sessions that took place in weeks five and six, before the student teachers went out to the schools for their school-based experience. These sessions, were facilitated by Professor Ned (specialisation lecturer). He prompted student teachers to participate and asked them questions about their interpretation and perception of the readings. He asked the student teachers a number of questions. The questions were about he difference between Biology (Life Sciences) teaching and the discipline of Biology; the importance of Biology and why learners should learn Biology, how learners develop Biological knowledge, establishing a relationship with learners and the characteristics of a good facilitator of learning. The responses to these questions served as the descriptive data, cases for each of the student teachers. A detailed report of the data collection process, the data analysis process and the descriptive data are presented in the appendix 1, section II – cycle two in the DVD. The analysis process of the descriptive data and the emergent themes are presented in 5.6.1. and 5.6.2. respectively.

### 5.6.1. Data analysis

The descriptive data was read and then emergent themes were developed from the relationships between the categories.

### 5.6.2. Themes

*5.6.2.1. Understanding of the nature and structure of Life Sciences*

The student teachers had developed a basic understanding that Life Sciences consists of two parts: process skills (syntactical) and content (substantive). They nevertheless differed with regard to their level of understanding and the nature of their understanding. While

Bernice stated, for example, that there is a "difference between Life Sciences teaching and the Life Sciences that we did at school." She was aware that Life Sciences as a discipline had particular characteristics and could be distinguished into theory and practical components. Carol stated that the Science subject, Life Sciences must relate to the Life Sciences discipline in that "they were the same." She was aware that the nature and structure of Life Sciences was changing all the time. According to Carol, "in learning Life Sciences there are practical and theory parts that must be worked with." Carol had the view that a fact is "acquired through learning." According to her, "through practicals you learn theory and there is substantive knowledge that will not change for example, these are my lungs", as this is a fact. Mack stated, "there is a difference between Life Sciences teaching and the Life Sciences that we did at school". This means, unlike the other two participants, Mack was aware that the nature of Life Sciences is such that it was changing, but "a child must be taught facts". He thought that children obtain knowledge via/through developing and using process skills.

*5.6.2.2. Understanding the syntactical and substantive structure of Life Sciences provides a platform for decisions about how to facilitate learning*

Bernice stated that as a facilitator of learning we need to ask "what is the Life Sciences that we need to teach to make them (the learners) aware of it." She expressed that "if you have the nature and structure of Life Sciences then as a facilitator of learning it gives you the platform from which you can work things out". She concluded that "this makes the teaching of Life Sciences more understandable." Carol stated that as a facilitator of learning she needed "learners to develop better syntactical structure (developing process skills)." She was aware that she could do this by asking questions of "how can learners' thinking skills be developed?" She knew that if she wanted learners to take responsibility for their own learning she still had to ensure that learning took place. Mack, as a facilitator of learning, believed that to get

learners to learn Life Sciences he would have to establish (develop) their process skills in order for them to obtain facts. Furthermore, he believed that for learners to learn Life Sciences they needed to be "taught respect for nature." He was aware of what was required for this to be achieved in stating that children could not be told "to respect nature if they do not know anything about the object (nature)." He said, "children come to have respect for things that they can see". Mack was also aware that when children "observe through the senses you need to use cognitive skills". He was aware that in learning Life Sciences learners must be able to apply the theory. His view was that "when learners construct meaning they can do whatever they can, they can create new things to use in new situations." Mack decided that as a facilitator of learning he would have to be "engaged with construction of meaning and to maximize the potential of the learners."

## 5.7. Step 5: Reflections on taking action and interpreting

Each student teacher's reflections of the specialisation sessions that focused on the structure and nature of Biology were elicited according to Mezirow's (1991) categories of reflection. I asked questions about the content (what) of the student teacher's reflections, the process (how) of making these reflections and the premise (why) the particular reflections were made to give meaning to Bertha, Carol and Mack's reflections. A detailed report of the data collection process, the data analysis process and the descriptive data is presented in the appendix 1, section II – cycle two in the DVD). The analysis process of the descriptive data and the emergent themes are presented in 5.7.1. and 5.7.2. respectively.

### 5.7.1. Data analysis

The descriptive data was read and then emergent themes were developed from the relationships between the categories.

### 5.7.2. Themes

*5.7.2.1. Syntactical and substantive meanings were developed, not Life Sciences content*

Due to their experiences the student teachers constructed their theory about the importance of understanding the syntactical and substantive nature of Life Sciences. According to Van Huizen *et al* (2005, p. 280) this theory that the student teachers constructed provided them with "frames for their inquiry into the meaning of educational situations and of their own role". Bernice had compared facilitating Life Sciences to the Life Sciences that she did at school. In doing so she was then able to understand the "difference between syntactical and substantive". Carol reflected that they (the student teachers) had "not done Life Sciences really but just the syntactical and substantive structures." And she thought that "(s)o jah, I think that is a good beginning for us to understand that it (Life Sciences) is one thing" it does not consist of two separate parts.

*5.7.2.2. Beliefs about facilitating Life Sciences (the role of a facilitator of learning)*

Bernice stated that her idea of the role of a facilitator of learning "is not really the idea that I had. I had a different experience at school. We never did any practical at school or work in the laboratory." Bernice's schooling experience was such that she learnt Life Sciences in the transmission style where content from the textbook was the primary focus. Mack reflected that he had "learnt a lot about the theory behind the Life Sciences". An example of the theory that he learnt was "things to use directly in the classroom … what we are teaching, the nature of it". Mack was in the process of experiencing change in his beliefs

about facilitating Life Sciences. Even though he was aware that what can be used in the classroom could influence his practice, he was anxious about the actual action of facilitating learning. This is evident from the question that he asked, “how will I facilitate learning” in the classroom. This is a clear indication that the technical – rationality approach (Schon, 1983) was not used to inform his practice. Mack thought that he had “progressed over these sessions (specialisation sessions) but he still expressed uncertainty about “where we are going from here. I am wondering about the end point in terms of my progress.”

*5.7.2.3. The role of the specialisation discussion sessions (the interactive situations).*

During the session the specialisation lecturer asked a number of questions that the student teachers had to think about. Some questions asked were: What do they say in the syntactical structure - about basic competencies? Could you observe without syntactical structure? He also made clarifying statements like: substantive nature is changing through the syntactical, and the syntactical structure does not change. He was aware of the importance of relaxing the student teachers during these sessions as he enquired after their comfort. Mack reflected that he had developed a good understanding of the words syntactical and substantive from “preparing for the specialisation session by reading the documents provided” and “it was not just reading the document that enabled this understanding; it was my active participation in the session that was of intense importance.” Bernice had participated during the sessions by her responding to questions asked by the specialisation lecturer and listening to the responses given by her colleagues. Carol also participated during the sessions but indicated that her participation was restricted in that she would have felt “more free to communicate if this was just a chat session”. Even though Carol expressed that she experienced discomfort during the

sessions, she did value these sessions as they made it "clearer [what reflections are] and she got a clearer understanding" of how to make them. Mack and Bernice expressed a similar thought. Bernice thought that because of her participation in it, she realised the importance of social learning.

Another feature of these sessions that promoted learning and development of the student teachers was that they knew in Bernice's words that they could "ask Professor (specialisation lecturer) something. So, yes I did know that I can ask questions". They also knew though that they would not get a response to their questions as the specialisation lecturer wanted them to think about the questions they asked and to respond to their own questions. The initial power relationship between Professor Ned and the student teachers evident in the first cycle during these discussion sessions was now more relaxed. This is evident from an interaction during the discussions where the specialisation lecturer (Professor Ned) stopped Bernice from asking a question by stating, "already done." Bernice was not happy with this incident and she had the confidence to raise it, discuss it and confront him about it.

*5.7.2.4. Influence of emotion*

Carol reflected on her feelings that she had when she was exposed to "the idea that the content was the most important and now we know the principles – [this] [1]Maak my deurmekaar." The reasons that she gave for this feeling was because "I had the idea that the content was important now the science processes are" and she was now going to have to "rethink what you are going to do in the classroom – that is the whole paradigm thing." This indicated that Carol was experiencing a personal challenge and change in her thinking

[1] Makes me confused

about facilitating learning in Life Sciences. Even though she felt good about learning the new knowledge on the nature and structure of Life Sciences she was also very confused with it. This links with Pajares (1992) where teachers' belief systems affect perception and strongly influence how they will process information She was expressing problems with processing this knowledge as it was too different from what she had experienced in her past experiences of being taught. Mack felt uncertain about how to facilitate learning as he was only given basic ideas on how to teach. His uncertainty was linked to the new knowledge that an individual due to his/her own experiences and the input of education theory, constructs and uses his/her practical wisdom when developing as a facilitator of learning. Mack's uncertainty was linked to who he is as a person and of what will be expected of him to facilitate learning in the classroom. Mack as an individual lacked self-confidence, and his Neethling Brain Instrument analysis indicated that he prefers the big picture not the detail. This absence of the big picture impacted negatively on his feelings about facilitating learning.

*5.7.2.5. The meaning and value of reflecting*

Bernice developed a meaning for reflections which she viewed as "writing down what you have learnt." Her reflections could be used to assess her progress, even though they only focused on the content, that is, cognitive knowledge that she had learnt. Bernice was still in the process of developing an understanding of what reflections are and also the skill of reflecting. Her reflections were at an academic, and not personal, level. Carol's understanding of reflections was different to Bernice's. She understood them to be "kind of what you did and what you learnt about it, how you feel about it." She characterised reflections as "you see yourself in what you have written? In the feeling thing you can see yourself". Carol understood that writing personal reflections was about sharing the feelings

that she experienced, not just the knowledge that she had gained. She also understood reflections to be used as an indicator of "who you are as a person." Mack understood reflections to be "it is going over all the important things that you think has been discussed and how you sort of assimilate that in your own life." He was aware furthermore, that reflecting was important for his learning. He did state that as a result of his reflecting, he now "definitely [thought] there is value in it." For Mack, "after doing it (reflecting)" he realised that reflecting is "actually thinking deeply about what we had done in the session". At this stage his reflections were still about important things, but focused on what was reflected on, the process of reflecting and the value of reflecting for his professional development.

## 5.8. Step 6: Evaluating Action

The evaluation stage focused on the analysis and evaluation of the intervention for this cycle and the issues that fed into the next cycle.

### 5.8.1. Data analysis

The descriptive data was read and then emergent themes were developed from the relationships between the categories.

### 5.8.2. Themes

*5.8.2.1. Each activity in the cycle was essential for self-constructed practice theories.*

The construction of each practice theory entailed the dynamic exploration and challenge to their developing identities of a facilitator of learning, both at personal and professional

levels. This exploration and development was evident from the issues raised during this cycle and their responses to these issues. Korthagen (2001c, p. 255) reminds us that these explorations of "student teachers' preconceptions" about facilitating learning are necessary if we want the student teachers to construct their own practice theories. Bernice, Carol and Mack's experiences of the action step challenged their current beliefs of facilitating learning and reflecting, their emotions, and their expectations of the professional development programme. The importance of a Life Sciences facilitator of learning integrating process skills and content for learners to construct the appropriate knowledge was a new experience for all three student teachers. The old belief that teaching was concerned with transferring content to learners was definitely being challenged. But, with this challenge came the question of according to Mack "how are we going to go about it?" So, this new experience brought further concerns and challenges for the student teachers with regard to what would be expected of them in their role as facilitators of learning.

The student teachers were aware that they had to focus and plan for the role of learners as active participants in the process of learning. This clearly is in line with the principles of experiential and authentic learning. This belief of a learner as playing an active role in learning was far removed from their own experiences of learning. This 'shakening' of beliefs further made the student teachers feel uncomfortable and in Carol's words: "deurmekaar". This is evident in the literature where according to (Abbot, 1999, p. 23) learning is a "messy process" But without this messiness, emotional and cognitive uncertainty, learning may not have been possible for the student teachers. This messy nature of learning is also intertwined with emotions, reflections and expectations. It is essential that we recognise and integrate the emotional, cognitive (Kolb & Fry, 1975, Leavy *et al*, 2007) and perceptual experiences of the student teachers for them to learn. We

also need to encourage student teachers to actively reflect on their experiences as awareness of their own learning (Korthagen, 2001b) was important for their construction of phronesis. As student teachers were only told to reflect with no template or guide as to what to reflect on and how to structure their reflections they experienced the process as an intensely personal one. This personal nature came from the depth of emotions and thoughts shared in these reflections. But, this process of reflecting does not take place automatically and it is for this reason that student teachers were asked to record their reflections and then to share them during the reflection sessions which were structured into the professional development programme.

*5.8.2.2. The elicitation of student teachers' expectations about aspects of the programme needs to be conducted.*

In as much as Carol stated that "we have not learnt any Life Sciences yet" as she expected to be taught Life Sciences in the programme, these expectations if left unattended could develop into concerns and these could impact on the process of learning. Negative emotions are normally associated with concerns and these could impact negatively on the construction of phronesis.

Bernice, Carol and Mack were each constructing their own practice theories of facilitating learning. These theories were influenced by the nature of who they were as people. But the challenge to their current beliefs of facilitating learning and reflecting, the emotions that they experienced, and their expectations of the professional development programme served to re-assert and also re-establish their identities of facilitators of learning. These identities were different now to what they were when they started off at the beginning of this cycle.

## 5.9. Conclusion

Analysis of how the student teachers' constructed a practice theory of facilitating learning during cycle two was presented. The themes developed described how the student teachers' practice theory was established and challenged during this cycle. The student teachers' reasons for wanting to teach and their perceptions and beliefs about facilitating learning were revealed. The reflecting and interpreting step revealed the importance of the strategies used to enhance the student teachers' construction of phronesis. The taking action step revealed how the student teachers' practice theory was challenged, against the professional dimensions of facilitating learning in the Life Sciences, and constructed in this process. The reflections on taking action and interpreting step revealed the importance of the strategies used to enable the student teachers to construct a practice theory. The evaluating action step revealed the critical aspects required for the student teachers to construct phronesis: the student teacher's experience of each activity in the cycle and the need to elicit the student teachers' expectations about aspects of the programme. Evidence was presented to support the themes developed in all the steps.

The evidence for how the student teachers constructed phronesis is described in this chapter. In the next chapter the analysis of how the student teachers constructed phronesis in cycle three will be presented.