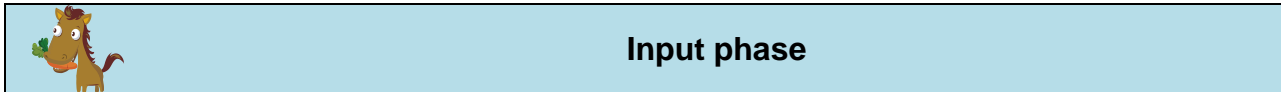


## SECTION 2

### OBSERVATION PROFILES

#### 2.1 PROFILE: PARTICIPANT 1



During the Input Phase the focus is on how the participant gathers information. This includes **planned**, **systematic**, **exploratory** working ways and **strategic** problem-solving (*cf.* Appendix 7). In order to be able to carry out the above, the participant needs verbal tools and vocabulary to process the information.

Figure 5.1 clearly indicate that Participant 1 had no systematic thinking and behaviour during the pre-test, as well as during Sessions 1 and 2 (*cf.* Appendix 5; Appendix 7) and lacked precise and accurate working ways. He would take away the correct card and replace it with a wrong card. This correlates with what Benjamin (2009), Feuerstein *et al.* (2007:23,24) and Tzuriel (2001:50-55, 72-73) affirm regarding deficient cognitive functions as discussed in Chapter 2 in regarding unplanned, unsystematic and impulsive exploratory behaviour (*cf.* 2.4).

During the first pre-test (*cf.* Figure 5.1) and Sessions 1 – 5 of the **CEPP** Participant 1's thinking was not logical and systematic (*cf.* Appendix 5; Appendix 7). He could not name *triangle* and *carrot* during the pre-test (*cf.* Appendix 4). He showed impulsive behaviour and lacked precision and accuracy. This links to the views of Epstein (2008:40); Lerner (2006:188) and Rivken, (2002:37) regarding impulsive learners who do not perform as well at school as reflective learners do. During the last post-test, he showed good progression. Although I had to remind him to check his work, he remembered the rules and showed potential to become a systematic worker. This correlates with Feuerstein's opinion (Lerner, 2006:188; Tzuriel, 2001:28) that the mediator can replace a learner's **impulsive** and **unorganised** working ways with **self-regulation** by means of planned, comparative behaviour, verbal tools and hypothesis-testing techniques.

Participant 1 experienced difficulty in predicting possible answers, and could not distinguish between big and small shapes (*cf.* Figure 5.1; Appendix 7). He had difficulty in visualising the answers and put the shapes out randomly. This shows a relationship with what Benjamin (2009); Feuerstein *et al.* (2007:23) and Tzurriel (2001:50-51) maintain in the literature about learners who experience deficient cognitive functions in the **Input** phase that will demonstrate extensive and vague perception (*cf.* 2.4.1).

However, Participant 1 counted the number of shapes he would need to build the construction; he did not count correctly and therefore put out less shapes than required (*cf.* Appendix 5; Appendix 7). To accurately observe is a cognitive skill to assess reasonableness of ideas by assessing basic information.

He also experienced difficulty in recognising sounds and pictures (*cf.* Appendix 5). He could not name objects that start with a specific letter, e.g. “*tent, tien, toon*”. He could identify some of the sounds, but could not identify “*k, g* and “*h*”. He struggled to identify sounds at the beginning, middle and end of a three-letter word (*cf.* Appendix 5). After mediation, the beginning and end sounds improved, but he still struggled with the middle sound, e.g. “*b-u-s*”. Learners who experience difficulty in learning to read are unable to recognise or isolate the sounds of words or the number of sounds in a word, as demonstrated by Participant 1. These learners have trouble with phonological awareness and may encounter problems with reading and spelling (Donald *et al.*, 2010:331; Lerner & Johns, 2009:265). Literature advocates the importance of the development of phonological awareness during the pre-school years before learners are taught to read (Donald *et al.*, 2010:330-332; Lerner & Johns, 2009:265-266; Lerner, 2006:341-342). Participant 1 also found it difficult to identify rhyme words such as **mat** and **rat**, which means that he could not recognise similarities in words. After mediation he could complete the activity (*cf.* Figure 5.1; Appendix 5).

Participant 1 possessed the verbal tools to process information and complete activities. He could identify which group of Smarties contained the most sweets and which the least (*cf.* Figure 5.1; Appendix 5). During the pre-test and the first four sessions of the **CEPP** he was able to consider only two sources of information at the same time (*cf.* Figure 5.1; Appendix 5). This skill developed throughout the **CEPP**. During the last

post-test and delayed post-test he could easily compare objects simultaneously and was able to notice differences and similarities in shapes, letters, numbers and pictures. This observation shows relation with literature (Eggen & Kauchak, 2010:40; Papalia *et al.*, 2008:269,270; Van Staden, 2005:53.54) regarding the ability of the five- to six-year old learner to classify and categorise (*cf.* 2.3).

**Photo 1: Differences and similarities in shapes**



Participant 1 enjoyed working with numbers and could easily recognise and count from 1 to 10 and backwards (*cf.* 2.3; Appendix 5). He could do simple addition and subtraction and estimation of groups.

He showed impulsive behaviour by elaborating on topics that reminded him of his own experiences. He elaborated on the meaning of pictures and asked a lot of questions during all the sessions. Because of over-eagerness he sometimes completed activities incorrectly (*cf.* Appendix5). According to Benjamin, (2009), Feuerstein *et al.* ( 2007:23, 24), and Tzuriel (2001: 50 – 55; 72-73), learners who experience problems with accuracy and a need for precision has deficient cognitive functioning in the **Input Phase**, which may continue in the elaboration and output phases if not dealt with in time (*cf.* 2.4.1). After mediation, where I delayed his response while providing him with opportunities for considering all aspects of the problem, he could work more systematically, especially during the last post-test and the delayed post-test.

During Sessions 11 and 12 as well as the last post-test and delayed post-test (cf. Appendix 5; Appendix 7), he learned to look at all the possibilities carefully. He worked more cautiously and considered options and possible answers before making a final decision. His planning became more systematic and he began to reflect on his answers and correct himself. He became more aware of his working methods, choices, actions and answers (cf. 2.2.2; Appendix 5). Participant 1's inferential thinking is still emerging (cf. Appendix 5).

It appears that Participant 1 developed from **Deficient (0)** cognitive functions to **Adequate (6)** cognitive functions in the Input Phase, because he applied previously used and semi-internalised strategies, and reflected awareness of rules and operations.

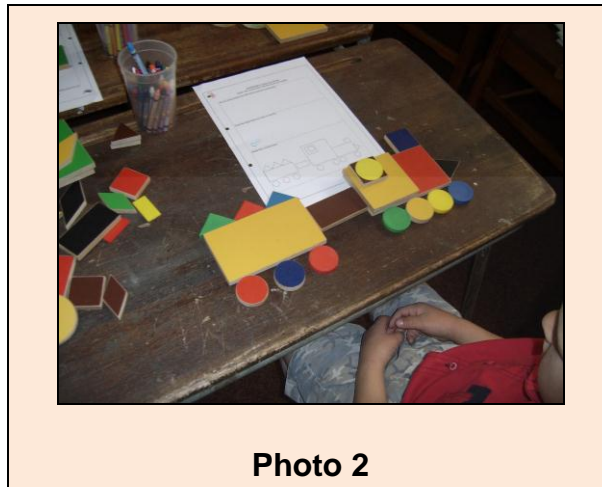


### Elaboration Phase

In the elaboration phase participants process all information received during the input phase. In other words, during this phase the participant should identify a starting point and compare various options, identify a problem and explain his solutions by means of hypothetical thinking. He should not reveal impulsive behaviour and should apply what he has learned from prior learning (cf. 2.4.2). Throughout this phase the participant's short-term and long-term memory are also challenged (Benjamin, 2009; Feuerstein *et al.*, 2007:23, 24; Tzuriel, 2001: 50 – 55; 72-73).

Initially Participant 1 could not identify a starting point when solving problems (cf. Appendix 5). He also did not work according to rules. No summative behaviour was present, because he did not estimate how many and which shapes he would need to complete his construction (cf. Appendix 5).

**Photo 2: Estimate shapes needed for construction**



He didn't approach his work logically. After mediation, he began to work more logically and started to select relevant information in order to solve a problem. From Sessions 7 and 8 onwards he could compare options before deciding on a final answer (*cf.* Appendix 5).

During the pre-test he could not compare objects but only made associations with objects, e.g. he explained that the bird and the leaf, the cat and bed, the cupboard and the clothes, the shapes and the furniture fitted together (*cf.* Appendix 4), but could not compare objects that belong together, e.g. bird and cat belong to the animal group. He was able to recall where in the environment he could find certain shapes, e.g. triangle = tent, roof (*cf.* Figure 5.1; Appendix 5; Appendix 7).

He could not select relevant cues for solving a problem and had difficulty in identifying a starting point when solving problems (*cf.* Appendix 5). After mediation, where I showed him to look for alternatives, he began to select cues. He experienced difficulty in identifying rhyme words, but after mediation he was able to identify words that sound the same. He found the analysis and synthesis of words very difficult (*cf.* Appendix 5).

He also experienced difficulty in thinking abstractly about the steps he should take to complete an activity (*cf.* Appendix 5). Initially he did it concretely; saw his mistake before correcting it. He showed trial and error behaviour. After a few intervention

sessions, he could identify his mistake and correct it (*cf.* Appendix 5). This behaviour was also evident in the last post-test.

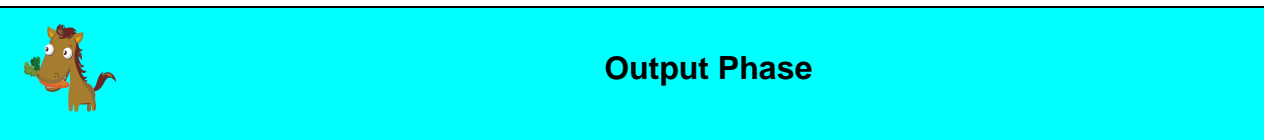
At first he could not explain his answers and could not communicate his thoughts. He had no step by step working procedure, could not find a strategy to solve problems and could not predict an outcome (*cf.* Appendix 5), but after a few intervention sessions he was confident about his answers, was able to explain them logically, started to work more systematically and searched for strategies (*cf.* Appendix 5). He was able to see the difference between shapes, and could verbalise the difference between a rectangle, square, triangle and circle (*cf.* Appendix 5). This correlates well with the views of Feuerstein *et al.* (2007:18) and Lomofsky (2007) that learners who experience a MLE classroom climate exhibit a decrease in anxiety of failure and are more able to develop strategies, search for alternative answers (divergent thinking) and work in a more systematic and planned manner.

Participant 1 enjoyed working with numbers and understood the concept of addition and subtraction. He could do the classification with number, dot and picture. At first he completed activities randomly, later on he displayed the need to rethink his final answer – this was not present in Sessions 1-5, but manifested from Session 6 onwards (*cf.* Appendix 5).

Participant 1 did not display hypothetical thinking, e.g. “a chair is brown, because it is made that way” (instead of “it is made of wood”). During Session 5 (*cf.* Appendix 5) he could identify shapes hidden in a bag, and was able to explain the characteristics of the shapes. From Session 8 onwards he could find a strategy to establish the answers (*cf.* Appendix 5). He could explain that if he had two sweets and he received three more, he would have more sweets. His hypothetical thinking seemed to be better when performing non-verbal activities. When I reminded him, he approached tasks more systematically. He was able to associate the function of an object with the size of the shapes, e.g. Small circles to make the wheels and the big circle to make the head of the man – the same with the rectangles (*cf.* Appendix 5). During the last post-test and the delayed post-test, he could explain his answers.

Initially his memory performance was fragile. He could remember **12** of the **24** pictures (cf. Appendix 4). After mediation 1 he could remember **10** of the **24** pictures and after mediation 2 he could remember **16** of the **24** pictures. During session 12 (cf. Appendix 5), where he had to categorise animals and try to remember the animals he saw during the activity, he could remember **11** of the **24** pictures. After mediation he could remember **17** of the **24** pictures (cf. Appendix 5). He showed progression in hypothetical thinking and internalising his thoughts (cf. Appendix 7).

It seems that Participant 1 developed from **Deficient (0)** cognitive functions to **Self-regulated (7)** cognitive functions in the Elaboration phase, due to the fact that he applied previously used and semi-internalised strategies and reflected awareness of rules and operations (cf. Appendix 5).



During the **output phase** aspects such as egocentric communication, blocking behaviour, visual transport, and transfer principle can play a decisive role in the thinking processes of a learner (cf. 2.4.3) (Benjamin, 2009; Feuerstein *et al.*, 2007:23, 24; Tzuriel, 2001: 50 – 55; 72-73).

Participant 1 showed egocentric behaviour throughout Session 1-6 (cf. Appendix 5). He could not separate the task at hand from his own world of experience. He would elaborate on what the pictures reminded him of. He talked a lot about himself and his father and made noises while working. I had to bring him back several times to focus on the task at hand. Because of mediation he could identify a starting point from Session 7 onwards, even though he sometimes still showed impulsive behaviour. This correlates with what literature states regarding MLE that can turn a cognitive deficient learner into an independent and self-regulating learner (Anon, 2008b; Fraser, 2006:9; Feuerstein, 1980:22).

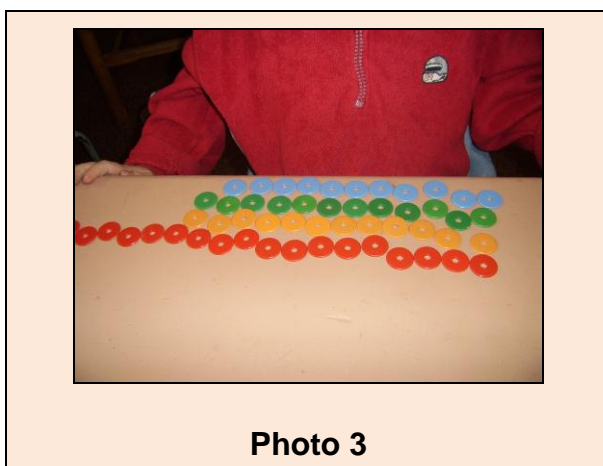
Initially Participant 1 did not learn according to rules and therefore gave a lot of trial and error responses. He struggled to think abstractly and still needed to figure things out

concretely (*cf.* Appendix 5). From Session 8 onwards he started to apply rules and strategies of what he had learned.

At first, during the pre-test and the first five session of the **CEPP** (*cf.* Appendix 5), he could not plan his choices; he made the choice first and then realised it was wrong. Later on he could apply the rules and strategies. He understood the rules, worked more systematically and applied the transfer principles (*cf.* 2.3; Appendix 5). He was eager to complete the activities and sometimes still made mistakes, because he did not think about his answer. This is in line with what literature maintains regarding meta-cognition which is still emerging in the young learner between the ages of four and six (*cf.* 2.2.2) (Robson, 2006:84; Botha *et al.*, 2003:276).

Participant 1 enjoyed working with numbers and could give examples of where one can use addition and subtraction, e.g. buying or losing something (*cf.* Graph 5.1; Appendix 5). He could create his own pattern of shapes and worked easily from outside the working space to the working space (*cf.* Appendix 5). He could internalise if one Smartie was taken away from a group, how many would be left (*cf.* Appendix 5).

**Photo 3: Working with numbers**



No deficiency of visual transport was present. Participant 1 could visualise change of directions, relations and connections internally when completing the activity where he had to match vehicles coming from various directions (*cf.* Appendix 5). He could make mental representations. He also could project virtual relations where he had to classify the coloured disks, e.g. he built a wall with the disks and explained why and how he

built the wall (*cf.* Appendix 5). He could see relations between objects, e.g. similarities and differences, and, the connection between the owl, the colour black and the night (*cf.* Appendix 5). Although he understood the principle of virtual relations, he still at times projected it incorrectly (*cf.* Appendix 5), but showed signs of progression from Session 5 onwards.

Participant 1 never showed any sign of blocking behaviour. He was a friendly little boy who showed no resistance to mediation. It appears that he developed from **Deficient (0)** to **Self-regulated (7)** in the Output phase as a result of his ability to formulate specific rules, strategies, attitudes and meanings and his competency to self-regulate.



### Non-intellective factors

**Non-intellective** factors also play an enormous role in the thinking process. For example, the learner's rejection of the mediator's attempts to teach and passive withdrawal from learning will adversely influence performance. Usually this can be related to previous negative experiences with a mediator and could have been caused by some emotional factors (*cf.* 2.7.4.2). An important factor determining how a learner approaches learning is directed by the learner's determination to work independently and correctly (intrinsic motivation). Factors such as a learner's awareness of his own thinking, his frustration tolerance, fear of failure, confidence in his answer, his level of interest and attentiveness and his openness towards mediation can all impact on the learner's accomplishments (*cf.* 2.7.5) (Benjamin, 2009; Feuerstein *et al.*, 2007:23, 24; Tzuriel, 2001: 50 – 55; 72-73).

Participant 1 was open to mediation. He never rejected my attempts to teach him. He did not show signs of previous negative experiences with a mediator or with learning, because he never withdrew passively from learning. He showed persistence on tasks and intrinsic motivation to successfully complete activities. He could work independently and became more aware of his own thinking (*cf.* 2.2.2). He constantly showed positive behaviour and no frustration was present. From Session 6 onwards he showed more control over the execution of tasks and wanted to work out problems (*cf.* 2.2.2;

Appendix 5). Although he was confident about his answers during the last post-test and delayed post-test, showed no fear of failure and expressed a high level of energy, vividness, attentiveness and interest, his attention was not as focused during the delayed post-test due to his parents' marital problems.

Participant 1 showed a **medium to high** level of modifiability, since he required less explanations and prompts to recall learning from previous learning experiences. He progressed from **Inadequate** (1) to **Autonomous** (8) regarding non-intellective factors and was also able to transfer learning and apply strategies (Benjamin, 2009).



## Reflection

### 😊 Task demands

The task demands in the **CEPP** (cf. 6.4.2) assisted in rectifying Participant 1's cognitive deficiencies and replaced his impulsive and unorganised behaviour with self-regulation by means of planned comparative behaviour, verbal tools and hypothesis-testing techniques.

### 😊 Content

The **Content** in Session 1 of the **CEPP** required participants to recognise basic colours, such as blue, green, red, yellow, white, black and orange. They had to compare and classify the colours, learned new vocabulary, had to give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** assisted Participant 1's classification abilities, expanded his vocabulary (he had to name objects of specific colours) and helped him to explain his decisions and to come up with solutions (cf. Appendix 5).

The **Content** in Session 2 of the **CEPP** required participants to recognise basic colours, seriate and create patterns with their coloured disks. They had to recognise the colours, learn new vocabulary (e.g. pattern), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** assisted Participant 1's

seriation skills, expanded his vocabulary and helped him to explain his decisions and to come up with solutions (*cf.* Appendix 5).

The **Content** in Session 3 of the **CEPP** required participants to recognise basic colours and determine the position of objects in relation to other objects. Participants had to learn new vocabulary (e.g. *above, behind, next to*, etc), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** assisted Participant 1's spatial orientation, expanded his vocabulary and helped him to explain his decisions and to come up with solutions (*cf.* Appendix 5).

In Session 4 the **Content** once again entailed colour recognition, comparison, classification, vocabulary (*more or less*, etc.), explanations and solutions. In this session new content, namely number quantity was addressed. Participants had to count the Smarties they received, categorise them in groups (according to colour), and determine which group contained the most sweets and which the least. Participants then had to put the Smarties on a graph (*cf.* Appendix 5). Participant 1 performed very well in this session and he was eager to explain his decisions and give solutions (*cf.* Appendix 5).

The **Content** in Session 5 involved colour recognition, vocabulary (triangle, rectangle, circle, square, and diamond), explanations and solutions. New content with regard to shape recognition, direction (left, right, next to, above, behind) and sequence were dealt with. Participants physically explored the characteristics of the various shapes (curved line, four equal sides, etc). Participant 1 performed well in these sessions, since he could concretely manoeuvre the shapes (*cf.* Appendix 5).

In Session 6 the **Content** entailed shape recognition, relationships between shapes, comparing shapes, vocabulary, such as *big, small, medium, big, bigger, biggest*, etc. Participants had to arrange the wooden shapes according to size and explain what they did and why they arranged the wooden shapes the way they did. Participants also had to build 3D constructions where they had to plan which shapes, how many shapes and what size shapes they would need. During Session 6 Participant 1 also had to give explanations and offer solutions. The task demands of Session 6 aided him in becoming a more reflective and critical thinker (*cf.* Appendix 5).

The **Content** in Session 7 involved recall regarding colour, shape, relationships and characteristics of shapes. Participants had to assemble shape pieces to create a specific shape. In doing this Participant 1 learned to compare, use vocabulary, explain his actions and come to solutions (*cf.* Appendix 5).

The **Content** in Session 8 required participants to discuss picture cards, categorise counters (according to colour), determine the number of counters, count them and match them to a counter, dot card, picture, and number name. While counting, the one-to-one-correspondence concept was also instilled during this session. Participant 1 was given the opportunity to explain how many more or less counters he had and what he could do to make the counters equal. Participants also had the opportunity to pose simple problems regarding *more or less*. The task demands in Session 8 enabled Participant 1 to count, compare, estimate, explain, offer solutions and learn new vocabulary (*cf.* Appendix 5).

The **Content** in Session 9 required participants to compare counters, to determine quantity, to do simple addition sums, determine more or less. New vocabulary, such as *plus, more, put together, equal, estimate*, was learned. Participant 1 enjoyed working with numbers and although he sometimes tended to make unnecessary mistakes due to over eagerness, he learned to work in a more planned and systematic way (*cf.* Appendix 5).

Session 10's **Content** included task demands such as comparing counters, breaking down numbers, determining quantity doing simple subtraction sums, determining more or less, giving explanations and offering solutions. New vocabulary, such as *minus, subtraction, less, take away, equal, estimate*, was learned. Although Participant 1 performed well when working with numbers, his skills improved due to the task demands in this session (*cf.* Appendix 5).

In Session 11 participants had to identify sounds already learned in their classroom setting. Participant 1 did not perform well in this Session. He struggled to identify the sounds, rhyme words, beginning, middle and end sounds of three-letter words. The following task demands in Session 11 contributed to Participant 1's improved language skills, letter recognition, building up three-letter words, breaking down three-letter words,

auditory discrimination, identifying beginning, middle and end sounds, comparing relationships between three letter words and sounds, identifying rhyme words, giving explanations and offering solutions (*cf.* Appendix 5).

The **Content** in Session 12 facilitated participants' direction, visual memory, categorisation, vocabulary, explanation and problem-solving capacity. The task demands in Session 12 assisted Participant 1 to distinguish between similarities and differences, to compare, match, explain, and offer solutions. The task demands also addressed and developed his spatial orientation (*cf.* Appendix 5).

### 😊 **Modalities: Sessions 1-12:**

The **modalities** utilised in Sessions 1, 2, 3, 5, 6, 7, 11 and 12 were figural, pictorial, verbal and symbolic. The modalities utilised in Sessions 4, 8, 9 and 10 included numerical modality. Although Participant 1 could execute instructions, which means that he understood the verbal instructions given to him, he preferred figural and numerical modalities.

### 😊 **Phases**

Since the **Input phase** demanded accurate gathering of information, need for precision and accuracy, considering two or more sources of information, clear perception, receptive verbal tools and spatial and time orientation, activities presented during Sessions 1 – 12 addressed all of the above and enabled Participant 1 to throughout the **CEPP** develop from deficient to emergent in the Input Phase (*cf.* Appendix 5).

During the **Elaboration phase**, participants' planning behaviour, selection of relevant cues to solve a problem, summative behaviour, pursuing logical evidence, hypothetical thinking and strategies, internalisation, memory, categorisation, comparison, problem-solving and relationships were observe. All the activities in the **CEPP** from Sessions 1 to 12 attended to the above. These task demands contributed to the fact that Participant 1 developed from **fragile** to **emergent** in the Elaboration phase.

Behaviour observed in the **Output phase** comprised egocentric communication, blocking behaviour, visual transport, projection of virtual relations, transfer of rules, clear and precise language, impulsive behaviour, and precision and accuracy. The task

demands in Session 1 to 12 of the **CEPP** all focused on the above, which contributed to Participant's 1 optimised ability in the Output phase from deficient to adequate.

### 😊 **Cognitive operations**

Focus was placed on the following Cognitive operations in Sessions 1-12 of the **CEPP**: Categorisation, comparison, classification, planned systematic behaviour, problem-solving, hypothetical thinking, mental representation, seriation and critical reflection. Since some of the cognitive operations (categorisation, comparison, classification, planned systematic behaviour, problem-solving, and hypothetical thinking) were repeated in Session 2, Participant 1 had the opportunity to revise and apply them together with the new cognitive operations, such as seriation and critical reflection (*cf.* Appendix 5).

### 😊 **Complexity, Abstraction and Efficiency**

**Complexity, Abstraction and Efficiency levels** were low in Sessions 1-3, low to medium in Sessions 4-6, medium in Sessions 7-9 and medium to high in Sessions 10-12 (*cf.* Appendix 5).

Deficient cognitive areas in Participant 1 could be addressed, adjusted and modified. Due to his **unsystematic, impulsive and inaccurate** working behaviour (*cf.* Appendix 5) he made numerous and unnecessary mistakes that affected his performance during the study, but would also impact negatively on future performance in a formal teaching setting, such as Grade 1, if not rectified. He also tended to “forget” **rules and strategies** and struggled to **solve problems** due to his impulsive behaviour during Sessions 1-6 (*cf.* Appendix 5). He also did not **verify** his work (*cf.* Appendix 5) which contributed to unnecessary mistakes. Participant 1 also experienced difficulties in **predicting** answers and solutions and did not display hypothetical thinking (*cf.* Appendix 5). He could not focus on an activity and had difficulty in remembering objects he had seen (*cf.* Appendix 5). Although his verbal tools were good, he struggled with identifying sounds (*cf.* Appendix 5), which may be an indication that his **auditory discrimination** was not sufficiently developed. All these factors disadvantaged him from performing well in the pre-test and may prevent him from reaching his potential in his school career, if not resolved in time (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt,

2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

In Participant 1 the following cognitive functions **developed well** during the **CEPP** according to the different principles of mediation (*cf.* 3.6.2) (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:10; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49):

Ψ **Intentionality and reciprocity:** Participant 1 developed an interest in learning and reflected on and corrected his work.

Ψ **Mediation of transcendence:** Participant 1 could apply strategies and rules in new learning experiences.

Ψ **Mediation of meaning:** Participant 1 constantly asked questions in searching for meaning.

Ψ **Mediation of competence:** Participant 1 was extremely competitive and strived at all times to complete tasks given to him correctly. He became motivated to complete activities successfully and regularly reflected on his work.

Ψ **Mediation of sharing behaviour:** During the **CEPP** Participant 1 learned to explain his thoughts and actions to others and learned to give others a chance to explain their thoughts and actions.

Ψ **Mediation of individuation:** Participant 1 developed into an independent and creative learner.

Ψ **Mediation of challenge:** Participant 1 became more and more excited to engage in tasks and was not afraid of activities that were not familiar to him and he regarded them as a challenge.

Ψ **Mediation of an awareness of the human being as a changing entity:** From Session 6 onwards Participant 1 became more aware of his own progress and began to reflect on his work.

Ψ **Mediation of the search for an optimistic alternative:** Participant 1 realised that problems could be solved in various ways and therefore started to look for alternative solutions when presented with a problem.

Ψ **Mediation of a feeling of belonging:** Participant 1 and his fellow participant shared their experiences and he began to realise that other people also have ideas and needs and that he should respect that. This experience assisted him to identify and bond with others.

However, it is important that these functions should be infused on a continuous basis in all future learning activities in order to be retained (Feuerstein *et al.*, 2002:526).

Ξ Cognitive functions still **need practice** and **attention** and I argue that these aspects will improve if the following principles of mediation are optimised frequently (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49):

Ξ **Mediation of regulation and control of behaviour:** Although Participant 1's impulsive behaviour improved throughout the **CEPP**, he should still be reminded to apply self-reflection and controlled and planned behaviour **Mediation of goal-seeking, goal-setting and goal-achieving behaviour:** Since Participant 1 did not behave in a goal-directed way, this skill should be developed and promoted. Attending to the above could eliminate the problematic cognitive functions.

In the first pre-test Participant 1 obtained a score of **22** and it took him **40** minutes to complete. When the first post-test was conducted, Participant 1 scored only **24** due to the fact that he had bronchitis, had a fever and did not feel well. I therefore decided to repeat the post-test with him the following week when he felt better. He then obtained a score of **30** and it took him **30** minutes to complete. This result clearly showed that Participant 1 had benefited from the intervention programme, especially when the second pre-test and post-test results showed a further improvement of **36 (30 minutes)** and **35 (25 minutes)** respectively. The results indicate that he performed quite well. Because it appears that some of the functions, as indicated above, are not yet involuntary, more exposure is necessary as he still needs to be reminded of planning

his behaviour. Participant 1's efficiency level, that is, rapid response, precision and energy, improved. He also performed in a more controlled manner and could apply strategies and rules learned.

In the delayed post-test, Participant 1 did not perform as expected. The delayed post-test took him **29** minutes and he scored **28**. His mother had left the family and he has no contact with her. He talked about her the whole time during the delayed post-test which may be an indication the he was emotionally distressed when the delayed post-test was conducted. This draws a parallel with literature that declares that when young learners experience events beyond their control, they become anxious, depressed and pre-occupied, which interferes with their learning (*cf.* 2.7.4.2) (Lerner & Johns, 2009:191; Nieman & Pienaar, 2006:94; Lerner, 2006:526). Emotionally troubled learners find it difficult to focus on academic tasks. They may be preoccupied with other problems that prevent them from successfully completing those tasks (*cf.* 2.7.4.2) (Lerner, 2009:189).

It seems that Participant 1 reacted positively to mediation and possesses the ability to flourish in a mediational classroom setting in which cognitive thinking is being developed. It also appears that retention took place and that Participant 1 benefited from the **CEPP** owing to his awareness of his own actions and improvement.

## 2.2 PROFILE: PARTICIPANT 2



### Input Phase

Initially Participant 2 was very unsure of himself and constantly sought the approval of the mediator. He displayed egocentric communication during the pre-test and the first five sessions of the **CEPP** (cf. Figure 5.2) by elaborating on pictures.

During the pre-test and first four sessions of the **CEPP** (cf. Figure 5.2; Appendix 5) Participant 2 possessed no systematic thinking or approach to tasks. He had no strategy, and demonstrated vague and sweeping perceptions. He hurried through activities and lacked precision and accuracy. This correlates with the findings of Benjamin (2009), Feuerstein *et al.* (2007:23, 24) and Tzuriel (2001:50-55, 72-73), namely that deficient cognitive functions contribute to unplanned, unsystematic and impulsive exploratory behaviour (cf. 2.4). With mediation he started using strategies and worked more systematically. He showed sporadic attempts to come to solutions and found it difficult to work with more than two features of objects at a time. According to Eggen & Kauchak (2010:40), Papalia *et al.* (2008:269-270) and Van Staden (2005:53-54), some young learners of four and five years of age will be able to classify objects based on two attributes simultaneously (colour and shape) (cf. Appendix 5).

In the first post-test, Participant 2 exhibited more systematic working ways by putting the cards out from left to right. Although he remembered rules and strategies he did not always apply them correctly, e.g. he told me that he had to remember to look for the same picture in other rows, but he did not apply it.

Participant 2's verbal tools were poor at first. He encountered problems with labelling of pictures and pronunciation and could not explain why he fitted pictures together, e.g. he put donkey and bicycle together, as well as hat and dog (cf. Appendix 4). During the pre-test (cf. Appendix 2) he could not recognise *donkey, dress, triangle, circle, rectangle, square and carrot* (cf. Appendix 4; Appendix 2). After mediation where he had to categorise the pictures, he remembered all the pictures.

He also had pronunciation difficulties where he replaced the “r” with a “l”. He could not explain why the pictures fitted in specific groups, such as transport or furniture. He could not understand instructions and questions and it seemed that he had a shortage of vocabulary, e.g. he did not understand the question in the transfer exercise (*cf.* Appendix 5): “What is the difference between the two houses?” He also could not identify all the colours.

He struggled to identify sounds at the beginning, middle and end of a three-letter word (*cf.* Appendix 5). He could identify some of the sounds, but struggled to identify an object with the same sound. He could not name words that began with the same letter, e.g. “*mot, mop, muis*” (*cf.* Appendix 5). He could identify “*l, u, a, r, m, t, b*”, but struggled to identify “*f, e, h, n, d, s*”. Learners who experience difficulty in learning to read are unable to recognise or isolate the sounds of words or the number of sounds in a word, as in the case of Participant 2. These learners have trouble with phonological awareness and will encounter problems with reading and spelling (*cf.* 2.7.2) (Lerner & Johns, 2009:265). Literature advocates the importance of the development of phonological awareness during the pre-school years before learners are taught to read (*cf.* 2.7.2) (Lerner & Johns, 2009:265-266; Lerner, 2006:341-342). Participant 2 also found it difficult to identify rhyme words, such as *mat* and *rat* which means that he could not recognise similarities in words. After mediation he could complete the activity (*cf.* Appendix 5).

He clearly understood categorisation, because the moment he remembered the circle, he automatically remembered the shape group and called out all the other shapes (*cf.* Appendix 4; Appendix 7). He internalised the concept of groups because he remembered the pictures in their groups (*cf.* Appendix 4). This connects with Feuerstein’s theory (*cf.* 3.6.1) that learners who have learned (by means of mediation) how to select and focus on relevant stimuli, become more responsive and can benefit from it (*cf.* 3.6.1) (Feuerstein *et al.*, 2007:13; Fraser, 2006:9; Pena *et al.*, 2006:1038; Feuerstein *et al.*, 2005; Haywood, 1994:34).

From Session 10 onwards Participant 2 worked more reflectively, planned his actions, followed instructions, worked more accurately and considered his answers better (*cf.*

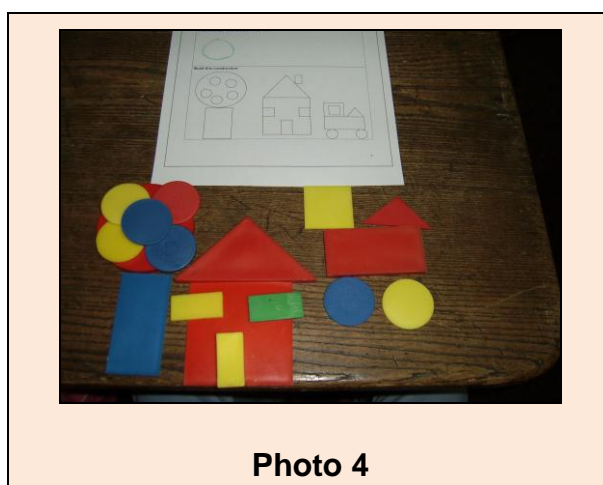
Appendix 5). His need for mastery improved, which associates with literature (Benjamin, 2009; Feuerstein *et al.*, 2007:23-24; Tzuriel, 2001:50-55; 72-73) regarding the importance of mediation to optimise a learner's determination to complete a task successfully (*cf.* 2.7.5).

During the last post-test he showed good progression. Although I had to remind him to check his work, he remembered the rules and showed potential to become a systematic worker.

He experienced difficulty in predicting possible answers (*cf.* Figure 5.2; Appendix 7). He had difficulty in visualising the answers and put out the shapes randomly. This shows a relationship with what Benjamin (2009), Feuerstein *et al.* (2007:23) and Tzuriel (2001:50-51) indicate about learners who experience deficient cognitive functions in the **Input** phase, namely that they will demonstrate extensive vague perception (*cf.* 2.4.1).

Although Participant 2 counted the number of shapes he required to build the construction, he did not count correctly and therefore put out less shapes than required (*cf.* Appendix 5; Appendix 7). To accurately observe is a cognitive skill at assessing reasonableness of ideas by assessing basic information.

#### **Photo 4      Estimating shapes needed to build the construction**



During Session 4 Participant 2 showed strange behaviour – he did not talk at all, just nodded his head, he seemed very tired and distracted and never smiled as he used to previously. He no longer joined in activities. After I spoke to his teacher, I realised he

had recently started taking “Ritalin”. A medical doctor prescribes Ritalin to individuals with Attention Deficit Hyperactivity Disorder (ADHD) (Lerner & Johns, 2009:228-229). Psycho-stimulant medication (of which Ritalin is one) should control hyperactivity, increase attention span and reduce impulsive and aggressive behaviour. Side-effects, such as insomnia, loss of appetite, drowsiness, stomach ache, depression and moodiness may be experienced (Lerner & Johns, 2009:228). Participant 2 exhibited signs of drowsiness, stomach ache, depression and loss of appetite.

Although Participant 2 made use of scanning and tracking, he could not predict, visualise or explain his answers. Although he could identify which group contained the most Smarties and which the least, he could not explain why the Smarties were the same (same colour) (*cf.* Figure 5.2; Appendix 5). From Session 10 he started to correct himself, although he was still impulsive at times, (*cf.* Appendix 5).

During the pre-test and the first six sessions of the intervention programme he was able to only consider two sources of information at the same time (*cf.* Figure 5.2 Appendix 5). This skill developed throughout the intervention programme. During the last post-test and delayed post-test he could easily compare objects simultaneously and was able to notice differences and similarities in shapes, letters, numbers and pictures (*cf.* 2.3). This shows relation with literature (Eggen & Kauchak, 2010:40; Papalia *et al.*, 2008:269,270; Van Staden, 2005:53.54) regarding the pre-school learner’s ability to classify and categorise (*cf.* 2.3).

Participant 2 enjoyed working with numbers and could easily recognise and count from 1 to 10 and backwards (*cf.* 2.3; Appendix 5). He recognised the numbers and pictures visually, as well as the relationship between the pictures and the dots (*cf.* Appendix 5). He could do simple addition and subtraction problems and estimation of groups.

He showed impulsive behaviour by elaborating on topics that reminded him of his own experiences. Because of over-eagerness he sometimes completed activities incorrectly (*cf.* Appendix 5). According to Benjamin (2009), Feuerstein *et al.* (2007:23, 24) and Tzurriel (2001: 50–55; 72-73), learners who experience problems with accuracy and a need for precision have deficient cognitive functioning in the **Input Phase**, which may continue in the elaboration and output phases if not dealt with in time (*cf.* 2.4.1) After

mediation, where I delayed his response while providing him with opportunities for considering all aspects of the problem, he could work more systematically, especially during the last post-test and the delayed post-test.

During Sessions 11 and 12 as well as the last post-test and delayed post-test (*cf.* Appendix 5), he learned to look at all the possibilities carefully when searching for an answer. He worked more cautiously and considered options and possible answers before making a final decision. His planning became more systematic and he began to reflect on his answers and correct himself. He became more aware of his working methods, choices, actions and answers (*cf.* 2.2.2; Appendix 5). This concurs with Feuerstein's (Feuerstein *et al.*, 2007:18) view that impulsive, emotional reactions can be reinstated by logical, objective and more controlled responses due to mediation (*cf.* 3.3).

Although his inferential thinking was emerging, it was not yet fully established, but he realised he should work accurately. The need was there but the skill was not yet fully established (*cf.* Appendix 5).

It is carefully assumed that Participant 2 developed from **Deficient (0)** cognitive functions to **Adequate (6)** cognitive functions in the Input Phase, because he matured from a passive participant to someone who could apply previously used strategies and began to reflect awareness of rules and operations.



### Elaboration Phase

Participant 2 displayed no logical planning and systematic, step-by-step working ways in the pre-test and first eight sessions of the **CEPP** (*cf.* Figure 5.2; Appendix 5). He struggled to identify a starting point and could not make cues for solving problems. He could not compare possibilities and did not demonstrate logic planning. His virtual relations were not good, because he could not apply rules and strategies (*cf.* Appendix 5; Appendix 7). From Session 9 (*cf.* 3.6.2; Appendix 5) onwards it seemed that he understood, by means of mediation, that good, strategic planning would produce

successful completion of task demands and activities. Although he understood the principle of transfer, he could not internalise and apply it.

In the last Post-test and the delayed Post-test Participant 2 revealed more systematic working ways (*cf.* Figure 5.2). This could be due to the improvement of cognitive functions in the Input Phase that also impacted positively in the Elaboration Phase (Feuerstein *et al.*, 2002:138). The solving of transfer problems increased because of his improved systematic working ways in the Input Phase. Since he still showed signs of egocentric behaviour he did not work as precisely and accurately as he should have done. He showed progression in internalising his thoughts because he could explain his answers from Session 9 onwards and he started to apply rules and strategies (*cf.* Appendix 5). Although he still sometimes exhibited impulsive behaviour, he could identify a starting point. This is in line with Feuerstein's belief that when a learner has learnt how to select and focus relevant stimuli, he becomes more responsive to direct stimuli (*cf.* 3.3) (Feuerstein *et al.*, 2007:13; Fraser, 2006:9; Pena *et al.*, 2006:138; Feuerstein *et al.*, 2005; Haywood, 1994:34).

Participant 2 also experienced difficulty with identifying rhyme words, naming objects that begin with a specific letter, and identifying first, middle and end sounds of three-letter words. He needed a lot of guidance to complete these activities (*cf.* Appendix 5).

Although he could identify the difference between big and small shapes, he was unsure about his answers and could not explain them (*cf.* Appendix 5). He relied on Participant 1 and the mediator to provide or confirm his answers. He listened to instructions carefully, but showed evidence of impulsive behaviour. At first he could only group the shapes according to shape and colour, but could later on also identify size (*cf.* Appendix 5). His cognitive strategies to verbalise his thoughts and actions were not in place, e.g. he knew that a piece of shape did not fit, but he could not explain why. He could not explain simple problems, e.g., "If I have three Smarties and you take one Smartie, how many Smarties are left?" (*cf.* Appendix 5).

**Photo 5: Simple numerical problems**



Participant 2 could plan the 3D designs he should build, but because he was so anxious to start building the blocks he forgot some of the blocks that he required. He didn't look at the shape pieces to inform his decision as to where they should fit. He took pieces and fitted them randomly everywhere. After I mediated him to look for the biggest parts and fit them first, he could do it (*cf.* Appendix 5). The mediator had to tell him repeatedly to work from left to right and from top to bottom.

Participant 2 correctly classified colours and could associate objects that reminded him of a certain colour, e.g. mouse and cheese belong to the yellow cloud. He also performed well in classifying objects in terms of direction, e.g. the lion is *under* the tree, the bird is *in* the tree. He could also visualise an object with size, e.g. the big rectangle will make the carriage of the train and the small rectangle will make the funnel of the train (*cf.* Figure 5.2; Appendix 5).

He reacted positively to mediation. Initially his long term memory was not good. During mediation he began to understand the categorising and grouping of pictures. His memory progressed from remembering **10** out of **24** pictures to **24** pictures out 24. During Session 12 he could at first remember 11 of the **24** pictures and after mediation he remembered **20** of the **24** pictures (*cf.* Appendix 5).

It seems that Participant 2 developed from **Deficient (0) to Self-regulated (7)** in the Elaboration phase, since he progressed from being passive to applying strategies and rules.



## Output Phase

Participant 2 showed egocentric behaviour throughout Sessions 1-8. He could not separate the task at hand from his own world of experience, e.g. when he had to name red objects, he mentioned his bicycle, his shirt, etc. Egocentric behaviour was evident when he talked about the bird at his house that caught a mouse. I had to bring him back several times to focus on the task at hand. With mediation he could identify a starting point to work from, as from Session 9 onwards, even though he sometimes still showed impulsive behaviour (*cf.* Appendix 5). This correlates with what literature says regarding MLE that can turn a cognitive deficient learner into an independent and self-regulating learner (Anon, 2008b; Fraser, 2006:9; Feuerstein, 1980:22).

### Photo 6: Identifying a starting point

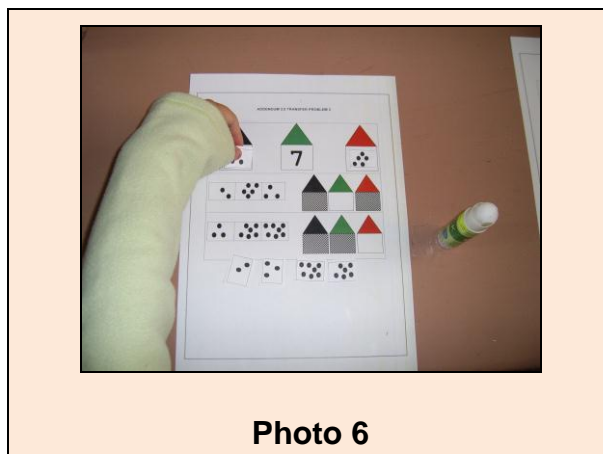


Photo 6

Although he understood rules regarding planned working ways, identifying a starting point, etc., he could not apply rules and strategies. He was eager to complete activities and sometimes still made mistakes, because he did not think about his answer. This correlates with literature regarding meta-cognition which is still emerging in the young learner between the ages of four and six (*cf.* 2.2.2) (Robson, 2006:84; Botha *et al.*, 1990:276). From Session 9 onwards he worked more systematically and applied the transfer principles (*cf.* 2.3; Appendix 5).

Participant 2 performed better in non-verbal activities (*cf.* Appendix 5) and struggled with activities where he had to verbalise his answers (*cf.* Appendix 5). This shows that certain task demands can have an influence on the successful execution of a task (Feuerstein *et al.*, 2002:132). He successfully completed numerical tasks and could identify the numbers and pictures during Sessions 8, 9 and 10 (*cf.* Appendix 5). He experienced difficulties to abstractly relate objects to each other and still worked very concretely (*cf.* Appendix 5).

It would seem that Participant 2 reacted very positively to mediation and never showed any signs of blocking behaviour. He developed from **Deficient (0)** to **Self-regulated (7)** in the Output phase, since he demonstrated passive behaviour in the beginning, while, in the end, he could formulate specific rules and strategies and became more self-regulatory.



### Non-intellective factors

Participant 2 did not always show persistent behaviour and he also needed a lot of motivation to persevere. During the pre-test and Sessions 1-8 of the **CEPP** he could not work independently (*cf.* Figure 5.2; Appendix 5). He was in constant competition with Participant 1 and therefore did not complete activities accurately.

During the pre-test (*cf.* Appendix 2) he did not show signs of passive behaviour regarding problem-solving, but still did not execute his responses logically. A total change of behaviour was evident in Session 4 (*cf.* Figure 5.2; Appendix 5). He was pale, quiet, his mouth was dry and he demonstrated very passive behaviour. His teacher confirmed that he was on Ritalin (*cf.* 🦜 Input Phase).

During the first post-test (*cf.* Figure 5.2) he became more aware of his own thinking and this improved throughout the second pre-test, post-test and delayed post-test (*cf.* 2.2.2; Figure 5.2). This corroborates research that proves that children who are aware of the way they study and learn, perform better than those who are less aware (Eggen & Kauchak, 2010:217; Papalia, *et al.*, 2008:365-366; Bjorklund, 2005:168; Kuhn & Dean, 2004:268). Participant 2 performed well in the second Post-test and the delayed Post-

test (cf. Figure 5.2). Although his attention span sometimes fluctuated, he displayed a high level of activity, energy, vividness, attentiveness and interest. He completed the second Post-test in only **25** minutes and scored **28** points. The delayed post-test was even better where he scored a total of **34**. This score seems to prove that retention took place and that Participant 2 apparently benefited from the **CEPP** (cf. Figure 5.2).

It appears that Participant 2 developed from **low to medium** modifiability and **medium to high modifiability** since he required fewer explanations and prompts to recall learning from previous learning experiences. Participant 2 progressed from **Deficient (1)** to **Autonomous (8)** regarding Non-intellective factors and were also able to transfer learning and apply strategies (Benjamin 2009).



### Reflection

Participant 2 seemed to have had experiences of previous failures because he was unsure of himself and cautious during the Pre-test, **CEPP** and the first Post-test when he had to answer questions. On consulting his mother, she confirmed that his father put him under a lot of pressure to perform well on the sports field as well as academically, and that he treated his young boy harshly. This supports what Lerner and Johns (2009:142; 250) say regarding uncertain behaviour and low self-concept in learners (cf. 2.7.4.2). According to Lerner and Johns (2009:142; 250), parents should try to avoid criticism and instead be supportive. The parent (especially in a father-son relationship) should guide and treat the child with respect. The child should feel that he or she is a respected, valuable, responsible and contributive member of the family even from as early as birth. When the child is forced to meet erratic and unsuitable standards imposed by the parent, learning becomes painfully difficult rather than enjoyable (cf. 2.7.4.2) (Lerner & Johns, 2009:142; 250).

### 😊 Task demands

The task demands in the **CEPP** (cf. 6.4.2) assisted in rectifying Participant 2's cognitive deficiencies and replaced his impulsive and unorganised behaviour with self-regulation

by means of planned comparative behaviour, verbal tools and hypothesis-testing techniques.

## 😊 **Content**

The **Content** in Session 1 of the **CEPP** required participants to recognise basic colours, such as blue, green, red, yellow, white, black and orange. Participants had to compare and classify the colours, learn new vocabulary, give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** optimised Participant 2's classification abilities, expanded his vocabulary (he had to name objects of specific colours). Since Participant 2 did not want to explain his decisions and come up with solutions, I motivated him continuously to verbalise his thoughts (*cf.* Appendix 5).

The **Content** in Session 2 of the **CEPP** required participants to recognise basic colours, seriate and create patterns with their coloured disks. Participants had to recognise the colours, learn new vocabulary (e.g. pattern), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** developed Participant 2's seriation skills, expanded his vocabulary, but he still struggled to explain his decisions and come up with solutions (*cf.* Appendix 2: 5).

The **Content** in Session 3 of the **CEPP** required participants to recognise basic colours, and determine the position of objects in relation to other objects. Participants had to learn new vocabulary (e.g. *above, behind, next to*, etc), o give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** assisted Participant 2 with his spatial orientation, expanded his vocabulary and although not yet fully in place, he started to explain his decisions and came up with solutions (*cf.* Appendix 5).

In Session 4 the **Content** once again entailed colour recognition, comparison, classification, vocabulary (more or less, etc.), explanations and solutions. In this session new content, namely number quantity was addressed. Participants had to count the Smarties they received, categorise them in groups (according to colour), and determine which group contained the most sweets and which the least. Participants then had to put the Smarties on a graph (*cf.* Appendix 5). Participant 2 performed well

in this session and although he was not eager to explain his decisions and give solutions, he began to share his thoughts (*cf.* Appendix 5).

The **Content** in Session 5 involved colour recognition, vocabulary (triangle, rectangle, circle, square, and diamond), explanations and solutions. New content with regard to shape recognition, direction (left, right, next to, above, behind) and sequence was dealt with in this session. Participants physically explored the characteristics of the various shapes (curved line, four equal sides, etc). Participant 2 performed well in these sessions, since he could concretely manoeuvre the shapes (*cf.* Appendix 5).

In Session 6 the **Content** entailed shape recognition, relationships between shapes, comparing shapes, vocabulary, such as big, small, medium, big, bigger, biggest, etc. Participants had to arrange the wooden shapes according to size and explain what they did and why they arranged the wooden shapes the way they did. Participants also had to build 3D constructions where they had to plan which shapes, how many shapes and what size shapes they would need. During Session 6 Participant 2 also had to give explanations and offer solutions. The task demands of Session 6 aided Participant 2 in slowly becoming a more reflective and critical thinker (*cf.* Appendix 5).

The **Content** in Session 7 involved recall regarding colour, shape, relationships and characteristics of shapes. Participants had to assemble shape pieces to create a specific shape. In doing this Participant 2 learned to compare, use vocabulary, explain his actions and come to solutions (*cf.* Appendix 5).

The **Content** in Session 8 required participants to discuss picture cards, categorise counters (according to colour), determine the number of counters, count them and match them to a counter, dot card, picture, and number name. While counting, the one-to-one-correspondence concept was also instilled. Participant 2 was given the opportunity to explain how many more or less counters he had and what he could do to make the counters equal. Participants also had the opportunity to pose simple problems regarding *more or less*. The task demands in Session 8 enabled Participant 2 to count, compare, estimate, explain, offer solutions and learn new vocabulary (*cf.* Appendix 5).

The **Content** in Session 9 required Participants to compare counters, to determine quantity, to do simple addition sums, determine more or less. New vocabulary, such as *plus, more, put together, equal, estimate*, was learned. Participant 2 enjoyed working with numbers and although he sometimes tended to make unnecessary mistakes due to over-eagerness, he learned to work in a more planned and systematic way (*cf.* Appendix 5).

Session 10's **Content** included tasks demands, such as comparing counters, breaking down numbers, determining quantity doing simple subtraction sums, determining more or less, giving explanations and offering solutions. New vocabulary, such as *minus, subtraction, less, take away, equal, estimate*, was learned. Although Participant 2 performed well when working with numbers, his skills improved due to the task demands in Session 10 (*cf.* Figure 5.2; Appendix 5).

In Session 11 participants had to identify sounds already learned in their classroom setting. Participant 2 struggled in this session. He experienced difficulty in identifying the sounds, rhyme words, beginning, middle and end sounds of three-letter words. Although Participant 2 still needs much practice in language skills, the following task demands in Session 11 assisted in his improved language skills, letter recognition, building up three-letter words, breaking down three-letter words, auditory discrimination, identifying beginning, middle and end sounds, comparing relationships between three-letter words and sounds, identifying rhyme words, giving explanations and offering solutions (*cf.* Figure 5.2; Appendix 5).

The **Content** in Session 12 facilitated participants' direction, visual memory, categorisation, vocabulary, explanation and problem-solving capacity. The task demands in Session 12 helped Participant 2 to distinguish between similarities and differences, to compare, match, explain, and offer solutions. The task demands also addressed and developed his spatial orientation (*cf.* Figure 5.2; Appendix 5).

#### 😊 **Modalities: Sessions 1-12:**

**The modalities** utilised in Sessions 1, 2, 3, 5, 6, 7, 11 and 12 were figural, pictorial, verbal and symbolic. The modalities utilised in Sessions 4, 8, 9 and 10 included numerical modality. Although Participant 2 could execute instructions, which means that

he understood the verbal instructions given to him, he preferred figural and numerical modalities.

### 😊 **Phases**

Since the **Input phase** demanded accurate gathering of information, need for precision and accuracy, considering two or more sources of information, clear perception, receptive verbal tools and spatial and time orientation, activities presented during Session 1 – 12 addressed all of the above and enabled Participant 2 to throughout the **CEPP** develop from deficient to emergent in the Input Phase (*cf.* Figure 5.2; Appendix 5).

During the **Elaboration phase** participants' planning behaviour, selection of relevant cues to solve a problem, summative behaviour, pursuing logical evidence, hypothetical thinking and strategies, internalisation, memory, categorisation, comparison, problem-solving and relationships were observed. All the activities in the **CEPP** from Sessions 1 to 12 attended to the above. These task demands contributed to the fact that Participant 2 developed from deficient to emergent in the Elaboration phase.

Behaviour observed in the **Output phase** comprised egocentric communication, blocking behaviour, visual transport, projection of virtual relations, transfer of rules, clear and precise language, impulsive behaviour and precision and accuracy. The task demands in Session 1 to 12 of the **CEPP** all focused on the above which contributed to Participant 2's optimised ability in the Output phase from deficient to adequate.

### 😊 **Cognitive operations**

Focus was placed on the following **Cognitive operations** in Sessions 1-12 of the **CEPP**: Categorisation, comparison, classification, planned systematic behaviour, problem-solving, hypothetical thinking, mental representation, seriation and critical reflection. Since some of the cognitive operations (categorisation, comparison, classification, planned systematic behaviour, problem-solving and hypothetical thinking) were repeated in Session 2, Participant 2 had the opportunity to revise and apply them together with the new cognitive operations, such as seriation and critical reflection (*cf.* Appendix 5; Figure 5.2).

## 😊 Complexity, Abstraction and Efficiency

**Complexity, Abstraction and Efficiency levels** were low in Session 1-3, low to medium in Sessions 4-6, medium in Sessions 7-9 and medium to high in Sessions 10-12 (*cf.* Appendix 5).

Deficient cognitive areas in Participant 2 could be addressed, adjusted and modified. Due to his **unsystematic, impulsive and inaccurate** working behaviour (*cf.* Appendix 5) he made numerous and unnecessary mistakes that affected his performance during the study, but would also impact negatively on future performance in a formal teaching setting, such as Grade 1, if not rectified. He also tended to “forget” **rules and strategies** and struggled to **solve problems** due to his impulsive behaviour during Sessions 1-6 (*cf.* Appendix 5). He also did not **verify** his work (*cf.* Appendix 5) which contributed to unnecessary mistakes. Participant 2 also experienced difficulties in **predicting** answers and solutions and did not display hypothetical thinking (*cf.* Appendix 5). He could not focus on an activity and had difficulty in remembering objects he had seen (*cf.* Appendix 5). Although his verbal tools were good, he struggled with identifying sounds (*cf.* Appendix 5), which may be an indication that his **auditory discrimination** was not sufficiently developed. All these factors disadvantaged him from performing well in the pre-test (*cf.* 2.7.2; Appendix 7) and may prevent him from reaching his potential in his school career, if not resolved in time (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

Cognitive functions that **developed well** during the **CEPP** according to the different principles of mediation are the following (*cf.* 3.6) (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49):

Ψ **Mediation of transcendence:** Participant 2 started to apply strategies and rules in new learning experiences

Ψ **Mediation of challenge:** Initially Participant 2 was very unsure of himself (cf. Appendix 2: Session 1-5), but became more and more excited to engage in challenging tasks.

Ψ **Mediation of an awareness of the human being as a changing entity:** From Session 6 (cf. Appendix 5) onwards Participant 2 became more aware of his own progress and began to reflect on his work.

Ψ **Mediation of the search for an optimistic alternative:** Participant 2 became very focused and realised that problems could be solved in various ways and therefore started to look for alternative solutions when presented with a problem.

Ψ **Mediation of a feeling of belonging:** Participant 2 started to share his experiences with Participant 1.

It is however important that these functions should be infused on a continuous basis in all future learning activities in order to be retained (Feuerstein *et al.*, 2002:526).

I maintain that cognitive functions that still **need practice** and **attention** will improve if the following principles of mediation are optimised frequently:

☒ **Intentionality and reciprocity:** Although Participant 2 really developed into a self-reflective learner, this behaviour should be encouraged continuously.

☒ **Mediation of meaning:** Since I suspect that Participant 2's language development is not up to standard, he should be inspired to ask questions and give explanations.

☒ **Mediation of sharing behaviour:** Although not yet fully developed, Participant 2 learned to explain his thoughts and actions to others and learned to give others a chance to explain their thoughts and actions.

☒ **Mediation of individuation:** Although Participant 2 worked in a more independent way, this could still improve.

☒ **Mediation of regulation and control of behaviour:** Although Participant 2's impulsive behaviour improved throughout the **CEPP**, he should still be reminded to apply self-reflection and controlled and planned behaviour.

☒ **Mediation of goal-seeking, goal-setting and goal-achieving behaviour:** Since this skill is not fully developed in Participant 2, it should be developed and promoted.

Attending to the above could eliminate the problematic cognitive functions.

As a consequence of the task demands (activities) in the **CEPP** (*cf.* Appendix 5), deficient cognitive areas in Participant 2 could be addressed, adjusted and modified. Due to his **unsystematic, impulsive and inaccurate** working behaviour (*cf.* Appendix 5) he made numerous and unnecessary mistakes that affected his performance during the study, but would also impact negatively on future performance in a formal teaching setting, such as Grade 1, if not rectified. He also tended to “forget” **rules and strategies** and struggled to **solve problems** due to his impulsive behaviour during Sessions 1-6 (*cf.* Appendix 5). He also did not **verify** his work (*cf.* Appendix 5) which contributed to unnecessary mistakes. Participant 2 also experienced difficulties in **predicting** answers and solutions and did not display hypothetical thinking (*cf.* Appendix 5). He could not focus on an activity and had difficulty remembering objects he had seen (*cf.* Appendix 5). His verbal tools were not good and he struggled to identify sounds (*cf.* Appendix 5) which may be an indication that his **auditory discrimination** was not sufficiently developed (*cf.* 2.7). All these factors disadvantaged him from performing well in the pre-test (*cf.* Appendix 4.4) and the first few sessions of the **CEPP** (*cf.* Appendix 5) and may prevent him from reaching his potential in his school career, if not resolved in time.

The following task demands included in the **CEPP** assisted in rectifying Participant 2’s cognitive deficiencies and replaced his impulsive and unorganised behaviour with self-regulation by means of planned comparative behaviour, verbal tools and hypothesis-testing techniques: He showed an improvement in his **planned behaviour, precise and accurate working ways, critical reflection, auditory discrimination, inferential thinking, prediction, transfer of strategies and rules, focusing and memory** (*cf.* Appendix 5). During **CEPP** (*cf.* Appendix 5) he looked more carefully at possibilities, worked with more caution and considered options before making final decisions, as well as reflecting on his work. He became motivated to complete activities successfully.

In the first pre-test Participant 2 obtained a score of **20** and it took him **45** minutes to complete it. The first post-test took him **22** minutes and he scored **21**. For the second

pre-test he scored **24** and he completed it in **13** minutes. When the second post-test was conducted, Participant 2 completed the test in **20** minutes and scored only **17** due to the fact that he had tonsillitis, had a fever and did not feel well. I therefore decided to repeat the post-test with him when he felt better the next week. He then obtained a score of **28** and it took him **27** minutes to complete. A score of **34** was obtained in the delayed Post-test and he completed this test in **30** minutes. This result clearly showed that Participant 2 had benefit from the intervention programme and that retention took place, which means that the **CEPP contributed** to Participant 2's level of efficiency, his rapid response, and the precision and energy that he put into the tasks (Feuerstein *et al.*, 2002:134-136).

The nature and quality of cognitive change in Participant 2 were remarkable. His efficiency level, that is: rapid response, precision and energy, also improved. He also performed in a more controlled manner and could apply strategies and rules learned.

It seems that Participant 2 reacted positively to mediation and possesses the ability to flourish in a mediational classroom setting in which cognitive thinking is being developed. It also appears that retention took place and that Participant 2 benefited from the **CEPP** owing to his awareness of his own actions and improvement.

## 2.3 PROFILE: PARTICIPANT 3



### Input Phase

Participant 3 worked in a planned and systematic way (*cf.* Figure 5.3). She reacted quickly to a stimulus and considered all possibilities carefully for solving each problem. Tracking and visual scanning to determine answers were present. She explored the implications of her answers by negating all options (*cf.* Appendix 5; Appendix 7).

Although Participant 3 possessed the verbal tools to label all the objects, recognise sounds and process information, she could at first not name **crow** and **coal** (*cf.* Figure 5.3; Appendix 5). She experienced difficulty in recognising beginning, middle and end sounds of three-letter words and rhyme words (*cf.* Figure 5.3; Appendix 5). The whole group found this activity, where they had to recognise rhyme words and the beginning, middle and end sounds of words, very difficult. This may be an indication of the teacher's classroom practices where she commenced with formal teaching too early and did not allow (or omitted) a foundation for the learning of sounds to take place (*cf.* 2.7.7). Literature advocates the importance of the development of phonological awareness during the pre-school years before learners are taught to read (*cf.* 2.7.2) (Lerner & Johns, 2009:265-266; Lerner, 2006:341-342). After mediation Participant 3 could recognise rhyme words and name objects that begin with the same sound. She was also able to identify the beginning, middle and end sounds of a three-letter word. During the Labelling Phase and throughout up to the delayed post-test (*cf.* Appendix 5) she successfully applied strategies for the grouping of pictures.

Participant 3 did not elaborate on a topic. Although she had a good vocabulary, she did not communicate her thoughts. This may be due to her language skills that were still in an emerging state or because of Participant 4, her group member, who did not give her a chance to explain her answers. Participant 3 internalised, but did not verbalise her thoughts and solutions to problems (*cf.* Appendix 5). However, from Session 9 onwards she communicated her thoughts, which might be an indication that language, as a thinking process, was developing due to the **CEPP** (*cf.* 2.7; Appendix 5) (Lerner &

Johns, 2009:265; Lerner, 2006:333). She was confident in her answers. During the first post-test negation strategies were already evident, which could be attributed to the effectiveness of the **CEPP** regarding the development of strategies (cf. Figure 5.3; Appendix 5).

Participant 3 could name all the colours (cf. Figure 5.3; Appendix 5) as well as the shapes correctly and was able to explain the difference between the shapes and their characteristics (cf. Figure 5.3; Appendix 5). She could categorise the shapes according to three attributes, namely colour, shape and size (cf. 2.3; Figure 5.3; Appendix 5). This observation shows relation with literature (Eggen & Kauchak, 2010:40; Papalia *et al.*, 2008:269,270; Van Staden, 2005:53.54) that the pre-school learner (five to six years old) can classify and categorise according to more than one attribute (cf. 2.3).

In Session 7, where participants had to fit shape pieces into the correct shape, Participant 3 could estimate which single pieces of shape fitted into which shape (cf. Figure 5.3; Appendix 5).

Participant 3 correctly grouped the unifix blocks, picture and number cards, counted with understanding and could easily add up to 5. She understood the concept of *more or less* and addition and subtraction. She could easily do addition and subtraction problems concretely, orally and abstractly (cf. Figure 5.3; Appendix 5). It seems that Participant 3's parents play a vital role in providing intellectual stimulation, emotional well-being and a supportive learning environment that encourage self-discipline, a positive self-concept, and an interest in literacy and a curiosity about learning (cf. 2.7.6) (Eggen & Kauchak, 2010:62-64; Springer, 2007:161; Lerner, 2006:96; Grosser, 1999:39).

**Photo 7: Addition and subtraction problems**



Participant 3 listened to instructions attentively; therefore she executed tasks and activities correctly. She also understood instructions, explanations and principles (*cf.* Appendix 5). She was a very focused learner and completed activities neatly. She approached and executed all activities in an organised, systematic manner (*cf.* Figure 5.3; Appendix 5). Participant 3 demonstrated a very strong need for precision and accuracy.

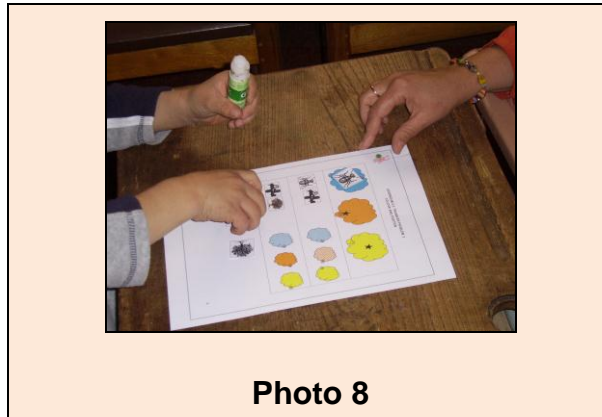
She reacted positively to stimuli and mediation, therefore her planning improved and she showed good progression throughout the **CEPP**. This correlates with the findings of Feuerstein *et al.* (2007:23,24) and Lomofsky (2007), namely that learners who experience a MLE classroom climate will exhibit a decrease in anxiety of failure and will be more able to develop strategies, search for alternative answers and work in a more systematic and planned manner (*cf.* 3.3).

Participant 3 developed from **Deficient (0)** cognitive functions where she accepted my verbal and motor intervention, to **Independent (9)** cognitive functions in the Input Phase, because of her internalisation, self-regulation and vicarious reactions to stimulus conditions.

During the first pre-test Participant 3 could solve problems and work them out for herself. She considered her options cautiously. Her spontaneous comparative behaviour and logic planning strategies were not yet fully in place, but emerging. From Session 3 onwards her reasoning abilities became evident. With the transfer problem

she could reason that the airplane should go into the blue cloud and not into the brown cloud (cf. Figure 5.3; Appendix 5).

**Photo 8: Transfer problem**



Participant 3 could easily compare the shapes, identify their characteristics and verbalise the difference between them (cf. Figure 5.3; Appendix 5). She showed spontaneous comparative behaviour and did not experience any problems with identifying and categorising the animals in the visual memory activity in Session 12 (cf. Appendix 5).

During post-test 1 Participant 3 could not identify her mistakes, but during the **CEPP** she became more and more aware of her working ways, to such an extent that during post-test 1, pre-test 2, post-test 2 and the delayed post-test she recognised her mistakes and corrected them spontaneously. This spontaneous correction of errors could be attributed to the mediational process during the task demands of the **CEPP** that exposed participants to critical evaluation and self-reflection. This observation correlates with Feuerstein's view that mediation will cause a decrease in trial and error response, dependency and impulsivity (Feuerstein *et al.*, 2007:8). Participant 3 did not exhibit impulsive behaviour and systematic exploratory approach was present as well as meta-cognitive skills (cf. Figure 5.3; Appendix 7).

Initially her memory performance was fragile. She could remember **10** of the **24** pictures (cf. Appendix 4). After mediation 1 she could remember **18** of the **24** pictures and after mediation 2 she could remember **24** of the **24** pictures. During session 12 (cf. Figure 5.3; Appendix 5) where she had to categorise animals and try to remember the animals

she had seen during the activities she could remember **19** of the **24** pictures. After mediation she could remember **24** of the **24** pictures (*cf.* Figure 5.3; Appendix 5). She showed progression in hypothetical thinking (*cf.* Appendix 5; Appendix 7) from Session 4 onwards as she contemplated possible answers.

It appears that Participant 3 developed from **Deficient (0)** cognitive functions where she acted on previous mediation and applied repetitions, but rules and strategies were not formulated, to **Independent (9)** cognitive functions in the Elaboration Phase, where she fully internalised mediation, became self-regulated and reacted positively to stimuli.



### Output Phase

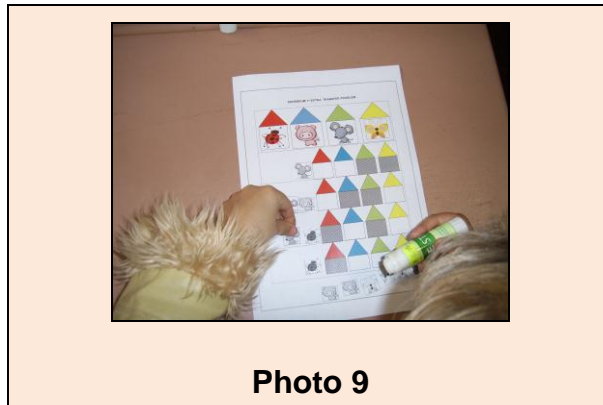
Participant 3's egocentric behaviour improved as from Session 4 (*cf.* Appendix 5) as she started to separate the task at hand from her own world of experience and worked with focused attention because of the mediational process. During the first pre-test and Session 1 (*cf.* Figure 5.3; Appendix 5) she could not identify a starting point, but as from Session 2 she worked from left to right; and from the top to bottom. This compares with what literature says regarding MLE that can turn a cognitive deficient learner into an independent and self-regulated learner (Anon, 2008b; Fraser, 2006:9; Feuerstein, 1980:22). Not only did the mediational process enable her to be less egocentric in contrast to the other participants, but her home environment possibly also contributed to her independence. Participant 3 probably learned to be independent and self-sufficient in a home where she was the second of four children, of whom the youngest two were under two years of age and the older sister experienced barriers to learning (*cf.* 2.7.6).

She learned according to rules and therefore did not give trial and error responses. She could think abstractly (*cf.* Figure 5.3; Appendix 5). Participant 3 showed perseverance, systematic working ways and could work beyond her own borders. Due to the mediational process in the **CEPP** she understood the transfer principle and successfully applied it in other tasks related to previous activities.

She understood the rules, worked systematically and applied the transfer principles (*cf.* Figure 5.3; Appendix 5). She was eager to complete the activities successfully and

meta-cognition was emerging. This is in line with what literature maintains regarding meta-cognition which is still emerging in the young learner between the ages of four and six (*cf.* 2.2.2) (Robson, 2006:84; Botha *et al.*, 1990:276).

**Photo 9: Systematic and neat working ways**



She enjoyed working with numbers and could give examples of where one can use addition and subtraction, e.g. buying or losing something (*cf.* Figure 5.3; Appendix 5). She could create her own pattern of shapes and worked easily from outside the working space to the working space (*cf.* Figure 5.3; Appendix 5). She could internalise if one Smartie was taken away from a group, how many would be left (*cf.* Figure 5.3; Appendix 5).

No deficiency of visual transport was present. She could visualise change of directions, relations and connections internally when completing the activity where she had to match vehicles from various directions (*cf.* Figure 5.3; Appendix 5). She could make mental representations. She also could project virtual relations where she had to classify the coloured disks (*cf.* Figure 5.3; Appendix 5). She could easily recognise relations among objects, e.g. similarities and differences.

I carefully assume that Participant 3 was open to mediation and did not demonstrate any blocking behaviour at any stage of the intervention. It seems that she did not show any resistance towards mediation. She developed from **Deficient (0)** cognitive functions, where she chose adequate strategies based on obtained insight, to **Independent (9)** cognitive modifiability in the Output Phase where she fully internalised mediation, became self-regulated and reacted vicariously to stimuli.



## Non-intellective factors

Participant 3 was open to mediation. She never rejected my attempts to teach her. She did not show any signs of previous negative experiences with a mediator or with learning, because she never withdrew passively from learning (*cf.* 2.7.4.2) (Lerner & Johns, 2009:190; Nieman & Pienaar, 2006:94; Lerner, 2006:527). She showed persistence on tasks and intrinsic motivation to complete activities successfully. She could work independently and became more aware of her own thinking (*cf.* 2.2.2). She constantly showed positive behaviour and no frustration was present. She demonstrated good locus of control and did not guess – she made sure of her answers. From Session 2 onwards she showed more control over the execution of tasks and wanted to work out problems (*cf.* 2.2.2; Figure 5.3; Appendix 5). She was confident in her answers and exhibited no fear of failure and expressed a high level of energy, vividness, attentiveness and interest. She regarded learning as a challenge. Her attention was focused right through the study. All of these factors could be indicative that Participant 3 developed a **high** level of modifiability since she required less explanations and prompts to recall learning from previous learning experiences. She progressed from **Deficient (0)** modifiability to **Independent (9)** modifiability and was also able to transfer learning and apply strategies (*cf.* Figure 5.3) (Benjamin 2009).



## Reflection

As a consequence of the task demands (activities) in the **CEPP** (*cf.* Appendix 5), deficient cognitive areas in Participant 3 could be addressed, adjusted and modified. She did not **verify** her work (*cf.* Appendix 2: Session 1-3), which contributed to unnecessary mistakes. Participant 3 also experienced difficulties in displaying hypothetical thinking (*cf.* Appendix 2: Session 1-4). Although her verbal tools were good, she struggled with identifying sounds (*cf.* Appendix 5) which may be an indication that her **auditory discrimination** was not sufficiently developed. All these factors disadvantaged her from performing well in the pre-test (*cf.* 2.7.2) and may prevent her

from reaching her full potential in her school career, if not resolved in time (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

### 😊 **Task demands**

The task demands in the **CEPP** assisted in rectifying Participant 3's cognitive deficiencies and replaced her impulsive and unorganised behaviour with self-regulation by means of planned comparative behaviour, verbal tools and hypothesis-testing techniques.

### 😊 **Content**

The **Content** in Session 1 of the **CEPP** required participants to recognise basic colours, such as blue, green, red, yellow, white, black and orange. Participants had to compare and classify the colours, learn new vocabulary, give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** optimised Participant 3's classification abilities, expanded her vocabulary (she had to name objects of specific colours). Since Participant 3 was not eager to verbalise her solutions, I motivated her continuously to explain her thoughts (*cf.* Figure 5.3; Appendix 5).

The **Content** in Session 2 of the **CEPP** required participants to recognise basic colours, seriate and create patterns with their coloured disks. Participants had to recognise the colours, learn new vocabulary (e.g. pattern), to give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** developed Participant 3's seriation skills, expanded her vocabulary, but she still struggled to explain her decisions (*cf.* Figure 5.3; Appendix 5).

The **Content** in Session 3 of the **CEPP** required participants to recognise basic colours, and determine the position of objects in relation to other objects. Participants had to learn new vocabulary (e.g. *above, behind, next to*, etc), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** further optimised Participant 3's spatial orientation and vocabulary. Although there was some

improvement, Participant 3 still preferred to internalise her thoughts (*cf.* Figure 5.3; Appendix 5).

In Session 4 the **Content** once again entailed colour recognition, comparison, classification, vocabulary (more or less, etc.), explanations and solutions. In this session new content, namely number quantity was addressed. Participants had to count the Smarties they received, categorise them in groups (according to colour), and determine which group contained the most sweets and which the least. Participants then had to put the Smarties on a graph (*cf.* Appendix 5). Participant 3 performed well in this session and began to share her thoughts (*cf.* Figure 5.3; Appendix 5).

The **Content** in Session 5 involved colour recognition, vocabulary (triangle, rectangle, circle, square, and diamond), explanations and solutions. New content with regard to shape recognition, direction (left, right, next to, above, behind) and sequence were dealt with. Participants physically explored the characteristics of the various shapes (curved line, four equal sides, etc). Participant 3 performed well in this session (*cf.* Figure 5.3; Appendix 5).

In Session 6 the **Content** entailed shape recognition, relationships between shapes, comparing shapes, vocabulary, such as *big, small, medium, big, bigger, biggest, etc.* Participants had to arrange the wooden shapes according to size and explain what they did and why they arranged the wooden shapes the way they did. Participants also had to build 3D constructions where they had to plan which shapes, how many shapes and what size shapes they would need. During Session 6, Participant 3 could explain her actions and verbally offer solutions. The task demands of Session 6 optimised her reflective behaviour (*cf.* Figure 5.3; Appendix 5).

The **Content** in Session 7 involved recall regarding colour, shape, relationships and characteristics of shapes. Participants had to assemble shape pieces to create a specific shape. Participant 3 systematically compared single pieces of shape to complete the activity. She also explained her actions with more confidence (*cf.* Figure 5.3; Appendix 5).

The **Content** in Session 8 required participants to discuss picture cards, categorise counters (according to colour), determine the number of counters, count them and

match them to a counter, dot card, picture, and number name. While counting, the one-to-one-correspondence concept was also instilled. Participant 3 could explain how many more or less counters she had and what she could do to make the counters equal. Participants also had the opportunity to pose simple problems regarding more or less. The task demands in Session 8 enabled Participant 3 to count, compare, estimate, explain, offer solutions and learn new vocabulary (*cf.* Figure 5.3; Appendix 5).

The **Content** in Session 9 required participants to compare counters, determine quantity, do simple addition sums, determine more or less. New vocabulary, such as *plus, more, put together, equal, estimate*, was learned. Participant 3 enjoyed working with numbers and her systematic working ways improved further (*cf.* Figure 5.3; Appendix 5).

Session 10's **Content** included tasks demands such as comparing counters, breaking down numbers, determining quantity, doing simple subtraction sums, determining more or less, giving explanations and offering solutions. New vocabulary, such as *minus, subtraction, less, take away, equal, estimate*, was learned. Although Participant 3 performed well when working with numbers, her skills further improved due to the task demands in Session 10 (*cf.* Figure 5.3; Appendix 5).

In Session 11 participants had to identify sounds already learned in their classroom setting. Participant 3 could identify all the sounds, but experienced difficulty in beginning, middle and end sounds of three-letter words. At first she could not tell what a rhyme word was, but with mediation she quickly understood the concept. The following task demands in Session 11 assisted in Participant 3's improved language skills: letter recognition, building up three-letter words, breaking down three-letter words, auditory discrimination, identifying beginning, middle and end sounds, comparing relationships between three letter words and sounds, identifying rhyme words, giving explanations and offering solutions (*cf.* Figure 5.3; Appendix 5).

The **Content** in Session 12 facilitated Participants' 3 direction, visual memory, categorisation, vocabulary, explanation and problem-solving capacity. The task demands in Session 12 helped Participant 3 to distinguish between similarities and differences, to compare, match, explain, and offer solutions. She applied the strategies

to successfully remember visual objects by means of categorisation. The task demands also addressed and developed her spatial orientation (*cf.* Figure 5.3; Appendix 5).

### 😊 **Modalities: Sessions 1-12:**

**The modalities** utilised in Sessions 1, 2, 3, 5, 6, 7, 11 and 12 were figural, pictorial, verbal and symbolic. The modalities utilised in Sessions 4, 8, 9 and 10 included numerical modality. Although Participant 3 could execute instructions, which means that she understood the verbal instructions given to her, she preferred pictorial, figural and numerical modalities.

### 😊 **Phases**

Since the **Input Phase** demanded accurate gathering of information, need for precision and accuracy, considering two or more sources of information, clear perception, receptive verbal tools and spatial and time orientation, activities presented during Sessions 1 – 12 addressed all of the above and enabled Participant 3 to develop throughout the **CEPP** from emergent to adequate in the Input Phase (*cf.* Figure 5.3; Appendix 5).

During the **Elaboration Phase**, participants' planning behaviour, selection of relevant cues to solve a problem, summative behaviour, pursuing logical evidence, hypothetical thinking and strategies, internalisation, memory, categorisation, comparison, problem-solving and relationships were observed. All the activities in the **CEPP** from Sessions 1 to 12 attended to the above. These task demands contributed to the fact that Participant 3 developed from emergent to adequate in the Elaboration Phase (*cf.* Figure 5.3; Appendix 5).

Behaviour observed in the **Output Phase** comprised egocentric communication, blocking behaviour, visual transport, projection of virtual relations, transfer of rules, clear and precise language, impulsive behaviour, and precision and accuracy. The task demands in Sessions 1 to 12 of the **CEPP** all focused on the above which contributed to Participant 3's optimised ability in the Output Phase from emergent to adequate (*cf.* Figure 5.3; Appendix 5).

## 😊 Cognitive operations

Focus was placed on the following **Cognitive operations** in Sessions 1-12 of the **CEPP**: Categorisation, comparison, classification, planned systematic behaviour, problem-solving, hypothetical thinking, mental representation, seriation and critical reflection. Since some of the cognitive operations (categorisation, comparison, classification, planned systematic behaviour, problem-solving, and hypothetical thinking) were repeated in Session 2. Participant 3 had the opportunity to revise them and apply them together with the new cognitive operations, such as seriation and critical reflection (*cf.* Appendix 5; Figure 5.3).

## 😊 Complexity, Abstraction and Efficiency

**Complexity, Abstraction and Efficiency levels** were low in Sessions 1-3, low to medium in Sessions 4-6, medium in Sessions 7-9 and medium to high in Sessions 10-12 (*cf.* Appendix 5).

Cognitive functions that **developed well** during the **CEPP** according to the different principles of mediation are the following (*cf.* 3.6) (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49):

- Ψ **Mediation of individuation:** Participant 3 successfully worked independently.
- Ψ **Mediation of regulation and control of behaviour:** Participant 3 worked in a self-reflective, controlled and planned manner.
- Ψ **Mediation of goal-seeking, goal-setting and goal-achieving behaviour:** Participant 3 was a motivated learner who wanted to achieve.
- Ψ **Mediation of transcendence:** Participant 3 successfully applied strategies and rules in new learning experiences.
- Ψ **Mediation of challenge:** Although initially a little bit unsure of herself, Participant 3 could meet challenges set by task demands.
- Ψ **Mediation of an awareness of the human being as a changing entity:** Participant 3 became aware of her own progress and reflected on her work.

Ψ **Mediation of the search for an optimistic alternative:** Participant 3 was very focused and realised that problems could be solved in various ways. She looked for alternative solutions when presented with a problem.

Ξ **Mediation of meaning:** Participant 3 understood instruction and could pose questions to Participant 4. She possessed the verbal tools to understand the meaning of concepts.

Ψ **Mediation of a feeling of belonging: In the beginning** (*cf.* Appendix 5) Participant 3 was dominated by Participant 4, but became assertive and in this way built a good relationship with Participant 4.

Ψ **Intentionality and reciprocity:** Although Participant 3 really developed into a self-reflective learner, this behaviour should be encouraged continuously.

It is however important that these functions should be infused on a continuous basis in all future learning activities in order to be retained (Feuerstein *et al.*, 2002:526).

I maintain that cognitive functions that still **need practice** and **attention** will improve if the following principle of mediation is optimised frequently Anon, 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49):

Ξ **Mediation of sharing behaviour:** Although not yet fully developed, Participant 3 learned to explain her thoughts and actions to others and learned to give them a chance to explain their thoughts and actions. She should however be encouraged to share her thoughts with others.

Attending to the above could eliminate the problematic cognitive functions.

In the first pre-test Participant 3 obtained a score of **17** and it took her **40** minutes to complete. The first post-test took her **20** minutes and she scored **35**. This result clearly showed that Participant 3 had benefited from the **CEPP**, especially when the second pre-test, post-test and delayed post-test maintained a score of **37** (**24** minutes and **22** minutes respectively). The results corroborate literature regarding early intervention programmes that can accelerate cognitive development (*cf.* 2.5) (Lewis, 1986; Brito, 1987; Martelli, 1987). It is clear that the **CEPP** contributed to Participant 3's level of

efficiency, her rapid response, and the precision and energy that she put into the tasks (Feuerstein *et al.*, 2002:134-136).

Participant 3's efficiency level, namely rapid response, precision and energy improved remarkably. She performed in a more controlled manner and applied strategies and rules learned.

It appears that Participant 3 reacts positively to mediation and flourishes in a mediational classroom where cognitive thinking is being developed. This result could indicate that Participant 3 benefited from the **CEPP** and retention was evident (*cf.* Figure 5.3).

## 2.4 PROFILE: PARTICIPANT 4

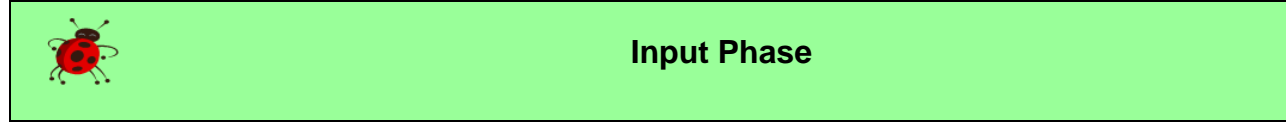


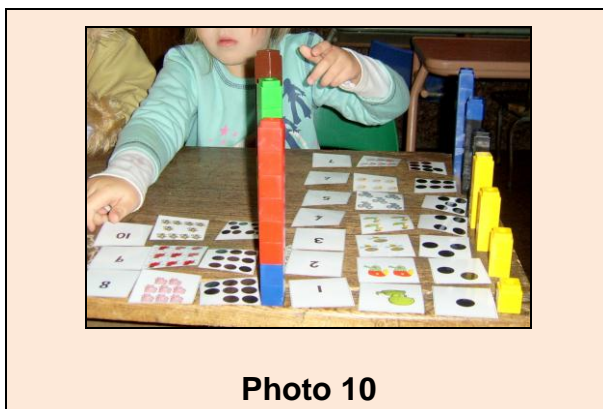
Figure 5.4 clearly indicate that Participant 4 had no planned, reflective, systematic, exploratory approach, tracking, scanning and systematic exploration during the pre-test, as well as during Sessions 1 to 7 (*cf.* Appendix 5; Appendix 7) and lacked precise and accurate working ways. She demonstrated impulsive behaviour and sometimes “jumped” into activities without thinking her strategies through. She did not approach her pattern activity systematically (*cf.* Appendix 5). Although she made use of finger tracking and visual scanning, she did not communicate her thoughts and answers.

No need for precision, accuracy and completeness in data gathering was present due to her over-eagerness to complete activities, which resulted in incorrect completion of activities. This links to the views of Epstein (2008:40), Lerner (2006:188) and Rivken, (2002:37) regarding impulsive learners who do not perform as well at school as reflective learners do. According to Benjamin (2009), Feuerstein *et al.* (2007:23, 24) and Tzuriel (2001: 50 – 55; 72-73), learners who experience problems with accuracy and a need for precision have deficient cognitive functioning in the **Input Phase**, which may continue in the Elaboration and Output Phases if not dealt with in time (*cf.* 2.4.1) After mediation, where I delayed her responses while providing her with opportunities for considering all aspects of the problem, she could work more systematically, especially during the last post-test and the delayed post-test (*cf.* Figure 5.4; Appendix 5).

Participant 4 reacted positively to stimuli and mediation; therefore her planning became more systematic from Session 8 onwards. She looked at all possibilities carefully and started to consider more than one source of information. During the last post-test, she showed good progression. She remembered the rules and showed potential to become a systematic worker. This correlates with what Benjamin (2009), Feuerstein *et al.* (2007:23,24) and Tzuriel (2001:50-55, 72-73) affirm regarding deficient cognitive functions that result in unplanned, unsystematic and impulsive exploratory behaviour, that could be reversed to systematic behaviour through mediation (*cf.* 2.4).

During Session 10 (cf. Appendix 5) she put out all the number cards in consecutive order and systematically placed the unifix blocks in little piles to facilitate the activity (cf. Photo 10). Good progression regarding systematic working ways was evident.

**Photo 10: Systematic working ways**



This draws a parallel with literature regarding the establishment of pre-required thinking behaviour due to mediation, that ensures self-regulation, application of rules, principles and strategies which diminish impulsivity in the learner (cf. 3.3) (Lerner & Johns, 2009:232; Lerner, 2006:188; Tzuriel, 2001:28).

Participant 4 did not experience difficulty in predicting possible answers, and could distinguish between big and small shapes (cf. Figure 5.4; Appendix 7). She however found it difficult to match shape pieces in Session 7, which was an indication that she struggled to analyse parts and whole relationships (cf. Appendix 5). This is also the reason why she experienced difficulties to identify the middle and end sounds of three-letter words, e.g. “*p-e-t*” (cf. Appendix 5). She found the direction activity difficult which indicated that her spatial relation was not up to standard and needed more attention (cf. Appendix 5). According to Papalia *et al.* (2008:29) and Van Staden (2005:54), most five- to six-year old learners should be able to understand their own position in space compared to other objects or persons near them (cf. 2.7.3.1). Her spatial relation and orientation in other words were behind the average development of learners her age and needed profound mediation.

Although Participant 4 possessed good receptive verbal tools to process information and she labelled objects accurately and precisely, she did not verbalise her thoughts

and explained her answers. She did not experience difficulty in recognising pictures and sounds, especially the beginning sounds of words (*cf.* Figure 5.4; Appendix 5). However, she struggled with identifying the middle and end sounds of three-letter words (*cf.* Appendix 5). After mediation, the beginning and end sounds improved, but she still struggled with the middle sound, e.g. “*b-u-s*”. Learners who experience difficulty in learning to read are unable to recognise or isolate the sounds of words or the number of sounds in a word, as was the case with Participant 4. These learners have trouble with phonological awareness and will encounter problems with reading and spelling (Lerner & Johns, 2009:265). Literature advocates the importance of the development of phonological awareness during the pre-school years before learners are taught to read (*cf.* 2.7.2) (Lerner & Johns, 2009:265-266; Lerner, 2006:341-342). Initially Participant 4 encountered problems with naming objects which sound the same, but after mediation she could name objects which sound the same, e.g. “*rok*” and “*bok*”, as well as words that begin with the same letter, e.g. “*pet, pos, pen*” (*cf.* Appendix 5). She could name the shapes as well as their characteristics. During Session 12 she could name all the animals and categorise them correctly (*cf.* Appendix 5).

Participant 4 could identify which group of Smarties contained the most sweets and which the least (*cf.* Figure 5.4; Appendix 5). During the pre-test and the first four sessions of the intervention programme she was able to consider only two sources of information at the same time (*cf.* Figure 5.4; Appendix 5). This skill developed throughout the intervention programme. During the last post-test and delayed post-test she could easily compare objects simultaneously and was able to notice differences and similarities in shapes, letters, numbers and pictures (*cf.* 2.3). This statement shows relation with literature (Eggen & Kauchak, 2010:40; Papalia *et al.*, 2008:269,270; Van Staden, 2005:53.54) regarding the importance pre-school learners’ possessing the capability to classify and categorise (*cf.* 2.3).

Participant 4 enjoyed numbers and could easily count from 1 to 10 and backwards and add and subtract problems orally, concretely and abstractly, as well as estimate groups (*cf.* 2.3; Figure 5.4; Appendix 5). Although she counted the number of shapes she required to build the 3 D-construction, she did not count correctly and therefore put out two shapes less than required (*cf.* Figure 5.4; Appendix 5; Appendix 7). To accurately

observe is a cognitive skill at assessing reasonableness of ideas by assessing basic information (Epstein, 2008:40; Wegerif, 2006:2; Van Staden, 2005:51; Rivken, 2002:37).

During Sessions 11 and 12 as well as the last post-test and delayed post-test (*cf.* Figure 5.4; Appendix 5), she learned to look at all the possibilities carefully. She worked more cautiously and considered options and possible answers before making a final decision. Her planning became more systematic and she began to reflect on her answers and correct herself. She became more aware of her working methods, choices, actions and answers (*cf.* 2.2.2; Figure 5.4; Appendix 5).

Although her inferential thinking was emerging, it was not yet fully established, but she realised she should work accurately. She sometimes still made impulsive decisions when asking herself the “if – then” question (*cf.* Figure 5.4; Appendix 5).

The above results could indicate that Participant 4 developed from **Deficient (0)** cognitive functions where she acted on previous mediation, sometimes applied repetition, but could not formulate rules and strategies to **Autonomous (8)** cognitive functions in the Input Phase, where her structural change was constantly present and evident.



### Elaboration Phase

Initially Participant 4 could not identify a starting point when solving problems (*cf.* Figure 5.4; Appendix 5). She also did not select relevant cues and could not work according to rules. She did not work logically and did not consider problems well. No summative behaviour was present, because she did not estimate how much and which shapes she would need to complete her 3D construction (*cf.* Figure 5.4; Appendix 5). She did not approach her work logically. After mediation, she began to work more logically and started to select relevant information in order to solve a problem. From Session 8 onwards she could compare options before deciding on a final answer (*cf.* Figure 5.4; Appendix 5).

During the pre-test she could not compare objects but could only make associations with objects. She was able to recall where in the environment she could find certain shapes, e.g. triangle = tent, roof (*cf.* Figure 5.4; Appendix 5; Appendix 7).

Participant 4 found it difficult to think abstractly about the steps she should take to complete an activity (*cf.* Figure 5.4; Appendix 5) and demonstrated trial and error behaviour. She struggled to correct herself, especially with tasks regarding spatial orientation. After a few intervention sessions, she could identify her mistake and correct it (*cf.* Figure 5.4; Appendix 5). This behaviour was also evident in the last post-test and delayed post-test.

Initially she could not, did not want to explain her answers, and could not communicate her thoughts, although it was evident that she considered possibilities. The process of producing spoken language is called **oral expressive language**. Learners who experience difficulty in this area understand speech and language produced by others, but have difficulty in producing speech or in talking themselves. These learners will perform well on non-verbal tasks. Some of these learners will be able to speak single words or short phrases, but are unable to formulate complete sentences (Lerner & Johns, 2009:265; Lerner, 2006:343).

Participant 4 had no step by step working procedure, could not find a strategy to solve problems and could not predict an outcome (*cf.* Figure 5.4; Appendix 5), but after a few intervention sessions she was confident in her answers, was able to logically explain them, started to work more systematically and searched for strategies (*cf.* Figure 5.4; Appendix 5). She was able to see the difference between shapes, and could verbalise the difference between a rectangle, square, triangle and circle (*cf.* Figure 5.4; Appendix 5).

During Session 9 she showed that she understood numbers (*cf.* Appendix 5). Her behaviour was much more systematic and planned from Session 8 onwards. She enjoyed working with numbers and understood the concept of addition and subtraction. She could do the classification with number, dot and picture. At first she randomly completed activities, later on she displayed the need to rethink her final answer – this had not been present in Sessions 1-7 (*cf.* Figure 5.4; Appendix 5). She could categorise

the Smarties and showed logical behaviour when doing so (*cf.* Appendix 5). She also found it easy to group the shapes according to shape and colour. Hypothetical thinking was not yet in place.

From Session 8 onwards her planning improved and she exhibited systematic working ways, e.g. worked from top to bottom, from left to right (*cf.* Appendix 5). During Session 7 she could not Appendix 5).

**Photo 11: Activity cards**



Participant 4 did not display any hypothetical thinking, e.g. “a chair is brown, because it is made that way” (instead of “it is made of wood”) (*cf.* Appendix 7). During Session 5 (*cf.* Figure 5.4; Appendix 5) she could identify shapes hidden in a bag, and was able to explain the characteristics of the shapes. From Session 8 on she could work out a strategy to find the answers (*cf.* Figure 5.4; Appendix 5). She could explain simple addition and subtraction problems orally. She was able to visualise a picture with the shapes and which shapes she would need to build the 3D-construction (*cf.* Figure 5.4; Appendix 5). During the last post-test and the delayed post-test, she could explain her answers.

Initially her memory performance was fragile. She could remember **9** of the **24** pictures. After mediation 1 she could remember **15** of the **24** pictures and after mediation 2 she could remember **24** of the **24** pictures. During session 12 (*cf.* Appendix 5) where she had to categorise animals and try to remember the animals she had seen during the activity she could remember **17** of the **24** pictures. After mediation she could remember

24 of the 24 pictures (cf. Appendix 5). She showed progression in hypothetical thinking and internalising her thoughts (cf. Appendix 7).

It appears that Participant 4 developed from **Deficient (0)** cognitive functions where she responded to tasks and mediation and accepted my verbal and motor intervention, to **Self-regulated (7)** cognitive functions in the Elaboration Phase where she applied previously used and semi-internalised strategies and reflected on her work.



### Output Phase

Participant 4 showed egocentric behaviour throughout Sessions 1-7 (cf. Appendix 5; Appendix 7). She was in a world of her own, made silly noises and pulled faces. She exhibited trial and error behaviour when executing tasks. She showed perseverance during Session 7 when she didn't give up the struggle to fit pieces of a shape (cf. Appendix 5). Because of mediation she could identify a starting point from Session 7 onwards, even though she sometimes still showed impulsive behaviour (cf. Figure 5.4). This correlates with what literature says regarding MLE that can turn a cognitive deficient learner into an independent and self-regulating learner (cf. 2.7.2.5) (Anon, 2008b; Fraser, 2006:9; Feuerstein, 1980:22).

Participant 4 experienced problems with visual transport and could not go from the immediate to the unknown. She could not transfer and project relationships (cf. Figure 5.4; Appendix 5). As from Session 4 she started to summarise the activities by scanning them visually and she also started to think more abstractly (cf. Figure 5.4; Appendix 5). From Session 8 (cf. Figure 5.4) onwards she started to apply rules and strategies of what she had learned.

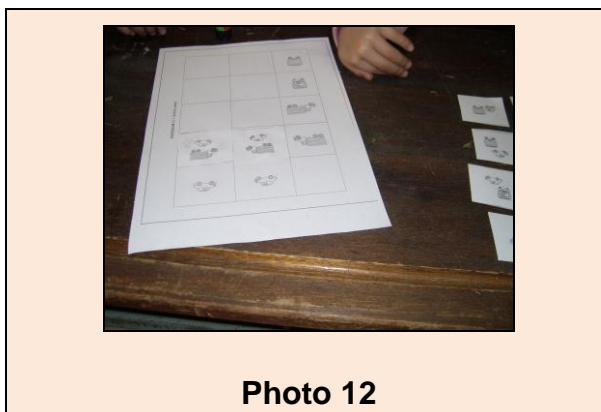
At first, during the pre-test and the first seven sessions of the **CEPP** (cf. Figure 5.4; Appendix 5), she could not plan her choices or apply the rules and strategies. From Session 8 onwards she understood the rule, worked more systematically and applied the transfer principles (cf. 2.3; Figure 5.4; Appendix 5). She was eager to complete the activities and sometimes still made mistakes, but not so many as in the beginning. This is in line with what literature maintains regarding meta-cognition which is still emerging

in the young learner between the ages of four and six (*cf.* 2.2.2) (Robson, 2006:84; Botha *et al.* 1990:276).

Participant 4 enjoyed working with numbers and could give examples of where one can use addition and subtraction, e.g. buying or losing something (*cf.* Figure 5.4; Appendix 5). She could create her own pattern of shapes (*cf.* Figure 5.4; Appendix 5). She could internalise if one Smartie was taken away from a group, how many would be left (*cf.* Figure 5.4; Appendix 5).

It seems that Participant 4 experienced problems with visual transport. Initially she could not visualise change of directions, relations and connections internally when completing the activity where she had to match vehicles from various directions (*cf.* Figure 5.4; Appendix 5).

**Photo 12: Spatial relations – direction**



She could see relations in objects, e.g. similarities and differences. Although she understood the principle of virtual relations from Session 8 onwards, she sometimes still projected it incorrectly (*cf.* Figure 5.4; Appendix 5) but showed signs of progression from Session 8 onwards.

Participant 4 never seemed to show any sign of blocking behaviour. She showed no resistance towards mediation. She developed from **Deficient (0)** cognitive functions where I had to encourage her to apply and transfer already learned strategies and rules to new learning content, to **Self-regulated (7)** cognitive functions in the Output Phase, where structural change became evident.



## Non-intellective factors

It appeared that Participant 4 did not have negative experiences regarding prior learning and was open to mediation. She never rejected my attempts to teach her. She did not show signs of previous negative experiences with a mediator or learning, because she never withdrew passively from learning (*cf.* 2.7.4.2) (Lerner & Johns, 2009:190; Nieman & Pienaar, 2006:94; Lerner, 2006:527). She showed persistence on tasks and intrinsic motivation to successfully complete activities. She could work independently and became more aware of her own thinking (*cf.* 2.2.2). She constantly showed positive behaviour and no frustration was present. From Session 8 onwards she showed more control over the execution of tasks and wanted to work out problems (*cf.* 2.2.2; Figure 5.4; Appendix 5).

Although she was confident in her answers during the last post-test and delayed post-test, showed no fear of failure and expressed a high level of energy, vividness, attentiveness and interest, it seems possible that Participant 4 showed a **medium to high** level of modifiability, since she required less explanations and prompts to recall learning from previous learning experiences. She progressed from **Deficient (0)** to **Autonomous(8)** with regard to Non-intellective factors and was also able to transfer learning and apply strategies (Benjamin 2009).



## Reflection

As a consequence of the task demands (activities) in the **CEPP** (*cf.* Appendix 5), deficient cognitive areas in Participant 4 could be addressed, adjusted and modified. Due to her **unsystematic, impulsive and inaccurate** working behaviour (*cf.* Appendix 5) she tended to make unnecessary mistakes that affected her performance during the study, and which could possibly also impact negatively on future performance in a formal teaching setting, such as Grade 1, if not rectified. She also did not verify her work (*cf.* Appendix 5), which contributed to unnecessary mistakes. Participant 4 also

experienced difficulties in **predicting** answers and solutions and did not display **hypothetical thinking** (*cf.* Appendix 5). Although her verbal tools were good, she struggled with identifying sounds (*cf.* Appendix 5), which may be an indication that her **auditory discrimination** was not sufficiently developed. All these factors disadvantaged her from performing well in the pre-test and may prevent her from reaching her potential in her school career, if not resolved in time (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87). During **CEPP** (*cf.* Appendix 5) she looked at possibilities more carefully, worked with more caution and considered options before making final decisions, as well as reflecting on her work. She became motivated to complete activities successfully.

### 😊 **Task demands**

The task demands in the **CEPP** (*cf.* 6.4.2) assisted in rectifying Participant 4's cognitive deficiencies and replaced her impulsive and unorganised behaviour with self-regulation by means of planned comparative behaviour, verbal tools and hypothesis-testing techniques.

### 😊 **Content**

The **Content** in Session 1 of the **CEPP** required participants to recognise basic colours, such as blue, green, red, yellow, white, black and orange. Participants had to compare and classify the colours; learn new vocabulary, give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** optimised Participant 4's classification abilities, expanded her vocabulary (she had to name objects of specific colours). Since Participant 4 was not eager to verbalise her solutions, I motivated her continuously to explain her thoughts (*cf.* Figure 5.4; Appendix 5).

The **Content** in Session 2 of the **CEPP** required participants to recognise basic colours, seriate and create patterns with their coloured disks. Participants had to recognise the colours, learn new vocabulary (e.g. *pattern*), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** developed Participant

4's seriation skills and expanded her vocabulary, but she still struggled to explain her decisions (*cf.* Figure 5.4; Appendix 5).

The **Content** in Session 3 of the **CEPP** required participants to recognise basic colours, and determine the position of objects to other objects. Participants had to learn new vocabulary (e.g. *above, behind, next to*, etc), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** further optimised Participant 4's spatial orientation and vocabulary. However, she still did not want to verbalise her thoughts (*cf.* Figure 5.4; Appendix 5).

In Session 4 the **Content** once again entailed colour recognition, comparison, classification, vocabulary (more or less, etc.), explanations and solutions. In this session new content, namely number quantity was addressed. Participants had to count the Smarties they received, categorise them in groups (according to colour), and determine which group contained the most sweets and which the least. Participants then had to put the Smarties on a graph (*cf.* Appendix 5). Participant 4 performed well in this session and slowly began to share her thoughts (*cf.* Figure 5.4; Appendix 5).

The **Content** in Session 5 involved colour recognition, vocabulary (triangle, rectangle, circle, square, and diamond), explanations and solutions. New content with regard to shape recognition, direction (left, right, next to, above, behind) and sequence was dealt with. Participants physically explored the characteristics of the various shapes (curved line, four equal sides, etc). Participant 4 performed well in this session (*cf.* Figure 5.4; Appendix 5).

In Session 6 the **Content** entailed shape recognition, relationships between shapes, comparing shapes, vocabulary such as *big, small, medium, big, bigger, biggest*, etc. Participants had to arrange the wooden shapes according to size and explain what they did and why they arranged the wooden shapes the way they did. Participants also had to build 3D constructions where they had to plan which shapes, how many shapes and what size shapes they would need. During Session 6 Participant 4 still found it difficult to explain her actions and offer solutions verbally. The task demands of Session 6 optimised Participant 4's reflective behaviour (*cf.* Figure 5.4; Appendix 5).

The **Content** in Session 7 involved recall regarding colour, shape, relationships and characteristics of shapes. Participants assembled shape pieces to create a specific shape. Participant 4 systematically compared single shape pieces to complete the activity. With encouragement she explained her actions. (*cf.* Figure 5.4; Appendix 5).

The **Content** in Session 8 required participants to discuss picture cards, categorise counters (according to colour), determine the amount of counters, count them and match them to a counter, dot card, picture, and number name. While counting, the one-to-one-correspondence concept was also instilled. Participant 4 could explain how many more or less counters she had and what she could do to make the counters equal. Participants also had the opportunity to pose simple problems regarding *more or less*. The task demands in Session 8 enabled Participant 4 to count, compare, estimate, explain, offer solutions and learn new vocabulary (*cf.* Figure 5.4; Appendix 5).

The **Content** in Session 9 required participants to compare counters, determine quantity, do simple addition sums, determine *more or less*. New vocabulary, such as *plus, more, put together, equal, estimate* were learned. Participant 4 enjoyed working with numbers and her systematic working ways improved further (*cf.* Figure 5.4; Appendix 5).

Session 10's **Content** included tasks demands such as comparing counters, breaking down numbers, determining quantity, doing simple subtraction sums, determining more or less, giving explanations and offering solutions. New vocabulary, such as *minus, subtraction, less, take away, equal, estimate* were learned. Although Participant 4 performed well when working with numbers, her skills further improved due to the task demands in Session 10 (*cf.* Figure 5.4; Appendix 5).

In Session 11 participants had to identify sounds already learned in their classroom setting. Participant 4 could identify all the sounds, but experienced difficulty in identifying beginning, middle and end sounds of three-letter words. At first she could not tell what a rhyme word was, but with mediation she quickly understood the concept. The task demands in Session 11 assisted in Participant 4's improved language skills, letter recognition, building up three-letter words, breaking down three-letter words, auditory discrimination, identifying beginning, middle and end sounds, comparing

relationships between three-letter words and sounds, identifying rhyme words, giving explanations and offering solutions (*cf.* Figure 5.4; Appendix 5).

The **Content** in Session 12 facilitated participants' 4 direction, visual memory, categorisation, vocabulary, explanation and problem-solving capacity. The task demands in Session 12 helped her to distinguish between similarities and differences, to compare, match, explain, and offer solutions. She applied the strategies to successfully remember visual objects by means of categorisation. The task demands also addressed and developed her spatial orientation (*cf.* Figure 5.4; Appendix 5).

### 😊 **Modalities: Sessions 1-12:**

**The modalities** utilised in Sessions 1, 2, 3, 5, 6, 7, 11 and 12 were figural, pictorial, verbal and symbolic. The modalities utilised in Sessions 4, 8, 9 and 10 included numerical modality. Although Participant 4 could execute instructions, which means that she understood the verbal instructions given to her, she preferred pictorial, figural and symbolic modalities.

### 😊 **Phases**

Since the **Input Phase** demanded accurate gathering of information, need for precision and accuracy, considering two or more sources of information, clear perception, receptive verbal tools and spatial and time orientation, activities presented during Sessions 1 – 12 addressed all of the above and enabled Participant 4 to develop throughout the **CEPP** from emergent to adequate in the Input Phase (*cf.* Figure 5.4; Appendix 5).

During the **Elaboration Phase**, participants' planning behaviour, selection of relevant cues to solve a problem, summative behaviour, pursuing logical evidence, hypothetical thinking and strategies, internalisation, memory, categorisation, comparison, problem-solving and relationships were observe. All the activities in the **CEPP** from Sessions 1 to 12 attended to the above. These task demands contributed to the fact that Participant 4 developed from fragile to emergent in the Elaboration Phase (*cf.* Figure 5.4; Appendix 5).

Behaviour observed in the **Output Phase** comprised egocentric communication, blocking behaviour, visual transport, projection of virtual relations, transfer of rules, clear and precise language, impulsive behaviour, and precision and accuracy. The task demands in Sessions 1 to 12 of the **CEPP** all focused on the above which contributed to Participant 4's optimised ability in the Output Phase from fragile to adequate (*cf.* Figure 5.4; Appendix 5).

### **Cognitive operations**

Focus was placed on the following **Cognitive operations** in Sessions 1-12 of the **CEPP**: Categorisation, comparison, classification, planned systematic behaviour, problem-solving, hypothetical thinking, mental representation, seriation and critical reflection. Since some of the cognitive operations (categorisation, comparison, classification, planned systematic behaviour, problem-solving and hypothetical thinking) were repeated in Session 2, Participant 4 had the opportunity to revise them and apply them together with the new cognitive operations, such as seriation and critical reflection (*cf.* Appendix 5; Figure 5.4).

### **Complexity, Abstraction and Efficiency**

**Complexity, Abstraction** and **Efficiency levels** were low in Sessions 1-3, low to medium in Sessions 4-6, medium in Sessions 7-9 and medium to high in Sessions 10-12 (*cf.* Appendix 5).

Cognitive functions that **developed well** during the **CEPP** according to the different principles of mediation are the following (*cf.* 3.6) (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49):

Ψ **Mediation of individuation**: Participant 4 successfully worked independently.

Ψ **Mediation of regulation and control of behaviour**: Participant 4 worked in a self-reflective, controlled and planned manner.

Ψ **Mediation of goal-seeking, goal-setting and goal-achieving behaviour**: Participant 4 was a motivated learner who wanted to achieve success.

Ψ **Mediation of transcendence:** Participant 4 successfully applied strategies and rules to new learning experiences.

Ψ **Mediation of challenge:** Participant 4 could meet challenges set by task demands.

Ψ **Mediation of an awareness of the human being as a changing entity:** Participant 4 became aware of her own progress and reflected on her work.

Ψ **Mediation of the search for an optimistic alternative:** Participant 4 was very focused and realised that problems could be solved in various ways. She looked for alternative solutions when presented with a problem.

Ξ **Mediation of meaning:** Participant 4 understood instructions and could pose questions to Participant 3. She possessed the verbal tools to understand the meaning of concepts.

Ψ **Mediation of a feeling of belonging:** Participant 4 bonded with Participant 3.

Ψ **Intentionality and reciprocity:** Although Participant 4 really developed into a self-reflective learner, this behaviour should be encouraged continuously.

It is however important that these functions should be infused on a continuous basis in all future learning activities in order to be retained (Feuerstein *et al.*, 2002:526).

I maintain that cognitive functions that still **need practice** and **attention** will improve if the following principle of mediation is optimised frequently (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49):

Ξ **Mediation of sharing behaviour:** Although not yet fully developed, Participant 4 learned to explain her thoughts and actions to others and learned to give them a chance to explain their thoughts and actions. She should however be encouraged to share her thoughts with others spontaneously.

Attending to the above could eliminate the problematic cognitive functions.

Participant 4 completed the first pre-test in **45** minutes and scored **16**. In the first post-test it took her **22** minutes to gain a score of **30**. She completed the second pre-test took in **20** minutes and she scored **23** points. The second post-test took her **30** minutes

and she scored **36** points. The delayed post-test took her **29** minutes and she scored **35**. This score proves that retention took place and that Participant 4 benefited from the **CEPP** (cf. Figure 5.4). It is clear that the **CEPP** contributed to Participant 4's level of efficiency, her rapid response, and the precision and energy she put into the tasks (Feuerstein *et al.*, 2002:134-136).

Participant 4's efficiency levels, namely rapid response, precision and energy improved remarkably. She performed in a more controlled manner and applied strategies and rules learned.

It seems that Participant 4 reacted positively to mediation and possesses the ability to flourish in a mediational classroom setting in which cognitive thinking is being developed.

## 2.5 PROFILE: PARTICIPANT 5



### Input Phase

Participant 5 could not complete the Example Phase, Labelling Phase and Pre-test on the same day, due to lack of concentration and perseverance. The pre-test was conducted with him the following day. He struggled to label pictures, such as *cupboard*, *circle*, *donkey*, *dress*, *trousers*, *triangle*, *square*, *rectangle* and *carrot*. He labelled the cupboard as a door, the donkey as a horse and he could not identify the circle at all. He also got confused with a rectangle and square and could not accept a challenge (*cf.* Graph 5.14; Appendix 4; Appendix 7).

During the first pre-test, he found it difficult to plan in a systematic way (*cf.* Graph 5.14; Appendix 4.4). His reflective, systematic, exploratory approach was not well-developed. He did not understand explanations and could not distinguish between smaller and larger shapes and similarities and differences (*cf.* Appendix 5). He found the grouping of objects difficult and rushed through each of the stages of the post-test in order to be able to do what he wanted to (*cf.* Graph 5.14; Appendix 3.3). He exhibited hit and run and impulsive behaviour. Although he took a very long time to execute tasks, he could not complete them. He lacked precise and accurate working ways (*cf.* Appendix 5). This correlates with what Benjamin (2009), Feuerstein *et al.* (2007:23, 24) and Tzuriel (2001:50-55, 72-73) state, namely that deficient cognitive functions could contribute to unplanned, unsystematic and impulsive exploratory behaviour (*cf.* 2.4).

During the first post-test and second pre-test there sometimes were signs of more systematic working ways when putting the picture cards out, although it was not yet fully in place (*cf.* Graph 5.14; Appendix 4.4). Participant 5 could not work systematically from the top row to the bottom row and from left to right. As from page 7 in the first post-test he randomly put the picture cards in the houses and did not put them out in sequence (*cf.* Graph 5.14; Appendix 7). Although he was aware of the rule that if a picture card was already in the house, another card could not be put in the house, he did not apply it.

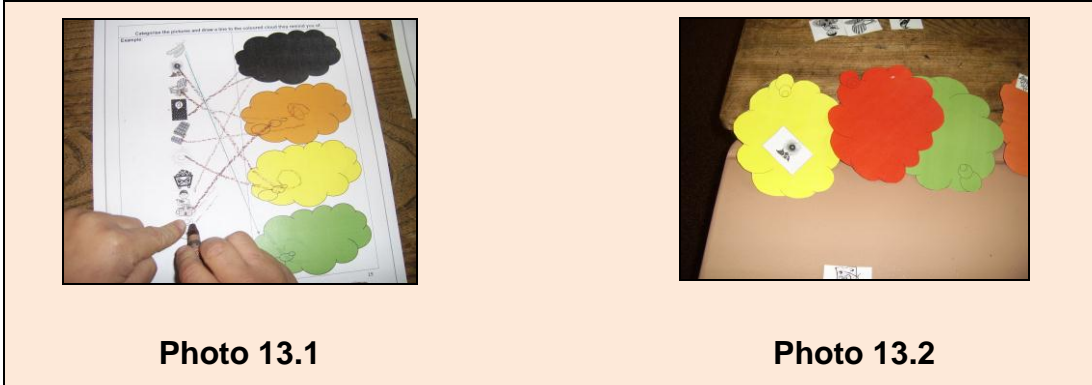
Participant 5 struggled with grouping, similarities and differences and the principle of more or less. He could not compare or consider two sources of information simultaneously. In the second pre-test there was some improvement but it was not yet in place. He did not want to continue from page 9 onwards in the second post-test (*cf.* Graph 5.14; Appendix 7). He could not complete the last post-test and I struggled getting him to complete the delayed post-test.

He totally blocked mediation. The moment he felt incapable of executing a task, he put his head down on his arms, withdrew himself and even threw the picture cards from the table. He did not work with a strategy and could not identify a starting point. He could not identify which group of Smarties contained the most sweets and which the least (*cf.* Appendix 2: Session 4) and did not make use of scanning or tracking. He had no negation strategies in place and reacted extremely slowly to stimuli. I constantly had to motivate and encourage him (*cf.* Appendix 5). He did not explore the implications of his answers and did not consider possibilities systematically, which might be an indication that he could not think reflectively. The reason for his blocking behaviour might be that he experienced difficulty interacting with peers, parents and teachers due to his poor language ability and therefore exhibited blocking behaviour where he acted out to avoid aversive academic tasks (*cf.* 2.7.2) (Lerner & Johns, 2009: 187-188; Lerner 2006:522-524).

Participant 5 did not “tolerate” interference from the mediator and wanted to do everything on his terms. He could not compare two objects accurately and found it difficult to process information.

He could not name *donkey, triangle, rectangle, square, carrot, circle, and cupboard*. He did not possess receptive verbal tools to understand meaning, questions and instructions (*cf.* Appendix 4; Appendix 7). He also had difficulty in recognising sounds and pictures. He demonstrated no negation strategies to group the pictures (*cf.* Appendix 5). He found it difficult to name *crow, coal, sunflower* and *peas* (*cf.* Appendix 2: Session 1). He could identify the colour clouds, but could not link the colour to a real concept (*cf.* Photo 5.4.13). He could name brown sand and yellow cheese (*cf.* Appendix 2: Session 1).

**Photo 13: Colour clouds**



Participant 5's language usage was not up to standard and he performed better when having visual resources instead of auditory instructions only (*cf.* Appendix 5). Since he was not verbally competent, he preferred to engage in figural and concrete modalities where he could physically manoeuvre objects, as in Session 7. The mediator or educator should however strive to develop verbal, pictorial, numerical and figural task opportunities (*cf.* 5.4.1) (Feuerstein *et al.*, 2002:132). Although he correctly named the colours, he could not create patterns. He was able to name the shapes, but could not explain their characteristics, due to his language deficiency (*cf.* 2.10.2).

Participant 5 performed well in Session 7 where he had to fit shape pieces into the original shape, because he could manipulate the pieces to figure out the concrete problem (*cf.* Photo 5.4.14).

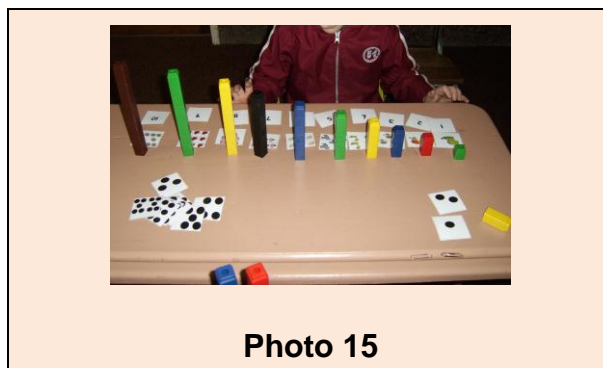
**Photo 14: Shapes – Part and whole**



During Session 8 (*cf.* Appendix 5) Participant 5 could count rhythmically up to 10, but without understanding. He could not count backwards and totally blocked out during Sessions 8-10 where he had to deal with numbers (*cf.* Graph 5.13; Appendix 2: Sessions 8-10). He could not determine which group of Smarties contained the most sweets and which the least (*cf.* Graph 5.13; Appendix 2: Session 4).

He did not understand addition (*cf.* Graph 5.13; Appendix 5) and I could not proceed to Session 10 which entailed subtraction. He could not explain the concept of more or less, addition, and subtraction. When counting unifix blocks (counters) he “skipped” objects and numbers. He could not put the correct amount of counters next to the number. He grouped the unifix blocks according to association with his family – his father was the tallest, followed by his mother and he made out the least number of counters because he is the youngest. With mediation, lots of motivation and encouragement, he could arrange the unifix blocks, pictures; dots and numbers from 1 to 10 (*cf.* Photo 5.4.15).

**Photo 15: Counting activity**



Since Participant 5 could not complete Session 9 (addition) and Session 10 (subtraction), I let him categorise the unifix blocks in a playful way (and according to his rules) in order to fit the correct amount of counters with the number and picture cards (*cf.* Graph 5.13; Photo 5.4.15).

During Session 11 he struggled to identify sounds at the beginning, middle and end of a three-letter word. He could identify some of the sounds, but could not name an object with the same sound (*cf.* Graph 5.13; Appendix 5). He had a limited vocabulary and

incorrectly named the *tiger* a *cheetah*. He stubbornly kept on calling the *tiger* a *cheetah* despite my attempts to teach him the correct name. He did not understand instructions, therefore he could not execute them correctly due to his poor verbal skills (*cf.* 2.10.2). He could not identify rhyme words or objects that begin with the same letter, e.g. “*pet*, *pot*” (*cf.* Appendix 5).

Participant 5 demonstrated egocentric behaviour during Session 5 where he had to work with shapes. He did not listen to any instructions, because he wanted to play with the wooden blocks. This links to the views of Epstein (2008:40); Lerner (2006:188) and Rivken, (2002:37) of impulsive learners who do not perform as well at school as reflective learners do (*cf.* 2.2.3.1). According to (Benjamin, 2009; Feuerstein *et al.*, 2007:23, 24; Tzuriel, 2001: 50 – 55; 72-73), learners who experience problems with accuracy and a need for precision have deficient cognitive functioning in the **Input Phase**, which may continue in the Elaboration and Output Phases if not dealt with in time (*cf.* 2.4.1).

Participant 5 really enjoyed the blocks. He could not categorise the shapes according to shape or size, but only according to colour (*cf.* Graph 5.13; Appendix 5). According to literature (Eggen & Kauchak, 2010:40; Papalia *et al.*, 2008:269,270; Van Staden, 2005:53.54), pre-school learners should be able to categorise objects according to at least two attributes. This statement proves that Participant 5’s categorising and classification skills were not on the same developmental level of that of his age group and therefore needed specific attention (*cf.* 2.3).

Although he repeatedly heard the characteristics of the shapes, he could not give a reason why this shape is called a *rectangle* and that one a *square*. He did not put out all the shapes he required to build his 3D object (*cf.* Appendix 5). His virtual relationships were not in place, because he could not tell me where in the environment he could find an object that reminded him of a square or triangle. He could not work if there were too many sources of information at a time, e.g. big, medium and small shapes in different colours. This shows a relationship with what Benjamin (2009), Feuerstein *et al.* (2007:23) and Tzuriel (2001:50-51) maintain about learners who experience deficient cognitive functions in the **Input Phase** that will demonstrate

extensive and vague perception (*cf.* 2.4.1). However, Participant 5 counted the number of shapes he required to build the construction, he did not count correctly and therefore put out less shapes than required (*cf.* Graph 5.13; Appendix 5 ; Appendix 7). To accurately observe is a cognitive skill at assessing reasonableness of ideas by assessing basic information (Epstein, 2008:40; Wegerif, 2006:2; Van Staden, 2005:51; Rivken, 2002:37) (*cf.* Table 2.1 & Figure 2.3).

Participant 5 understood the instructions in Session 12, but he experienced difficulty completing the activity. He struggled to categorise the pictures and could not remember them (*cf.* Appendix 5).

He did not show perseverance or an urge to work precisely and accurately. He showed no need to complete tasks correctly – he wanted to do everything on his conditions. Rules for inferential thinking were not present. He could not gather information in a complete way (*cf.* Graph 5.13; 5.14; 5.15; Appendix 5).

Participant 5 struggled to analyse parts and whole relationships, because he experienced difficulties identifying rhyme words, as well as the beginning, middle and end sounds of three-letter words, e.g. “*m-a-t*” (*cf.* Graph 5.13 ; Appendix 5). Learners who experience difficulty in learning to read are unable to recognise or isolate the sounds of words or the number of sounds in a word, as was the case with Participant 5. These learners have trouble with phonological awareness and will encounter problems with reading and spelling (*cf.* 2.10.2; Appendix 5) (Lerner & Johns, 2009:265). Literature advocates the importance of the development of phonological awareness during the pre-school years before learners are taught to read (Lerner & Johns, 2009:265-266; Lerner, 2006:341-342). ). He could not name objects that start with a specific letter, e.g. “*tent, tien, toon*”. He could identify some of the sounds (s, e, k), but could not identify “a, m, f, r, b, n, g, t, p, d, h, l”.

Participant 5 found the direction activity difficult, which indicates that his spatial relation is not up to standard and needs more attention (*cf.* Graph 5.13; Appendix 5). According to Papalia *et al.* (2008:29) and Van Staden (2005:54), most five- to six-year old learners should be able to understand their own position in space compared to other objects or persons near them (*cf.* 2.3). He needed a visual stimulus (picture) to determine

direction. He knew that the *monkeys* play in the *tree*, the *lion* in the *grass* and the *hippopotamus* in the *water*, but he could not indicate if the tree was at the **top**, the **bottom**, **left-** or **right-**hand side (*cf.* Graph 5.13; Appendix 5).

It seems possible that Participant 5 developed from **Deficient (0)** cognitive functions where he passively accepted the demand of the mediator to repetition to **Inadequate (1)** cognitive functions in the Input Phase because he sometimes responded to tasks and mediation dimensions.



### Elaboration Phase

Initially Participant 5 could not identify a starting point when solving problems (*cf.* Graph 5.13; Appendix 2: Session 1-4). He also did not select relevant cues and could not work according to rules. He did not work logically and did not consider problems and options at all. No summative behaviour was present, because he did not estimate how many and which shapes he would need to complete his 3D construction (*cf.* Graph 5.13; Appendix 5, 6). He did not approach his work logically (*cf.* Graph 5.13; 3.6.2.5; Appendix 5). He could not see the whole picture, e.g. he labelled the *carrot* as a *leaf*. He did not look for cues – he made random responses. He struggled to identify a starting point and seemed overwhelmed when there were too many objects to work with (*cf.* Appendix 5). He could not find cues for solving problems. During the second pre-test and the post-tests Participant 5 tried to identify a starting point in items 1 to 5, but from there on he worked in an unorganised manner, was impulsive and randomly put the cards out randomly (*cf.* Graph 5.15; Appendix 7). He could not work if there was too much information, e.g. linking unifix blocks to the number card, the dot card and the picture card with one another (*cf.* Graph 5.13; 5.14; Appendix 5).

Participant 5 found it difficult to think abstractly about the steps he should take to complete an activity (*cf.* Graph 5.13; Appendix 2: Session 1-4). He could not and did not want to explain his answers and could not communicate his thoughts, due to poor verbal skills. He had no step by step working procedure, could not find a strategy to solve problems and predict an outcome (*cf.* Graph 5.13; Appendix 5). He was able to

see the difference between shapes, but could not verbalise the difference between a rectangle, square, triangle and circle (*cf.* Appendix 2: Sessions 5, 6). He could not compare shapes with each other to identify similarities and differences. He experienced difficulties recognising and understanding relationships and did not demonstrate spontaneous comparative behaviour (*cf.* Graph 5.13; Appendix 2: Sessions 5, 6). He struggled to complete the shape patterns and could not create his own shape pattern (*cf.* Photo 5.4.16).

**Photo 16: Patterns**



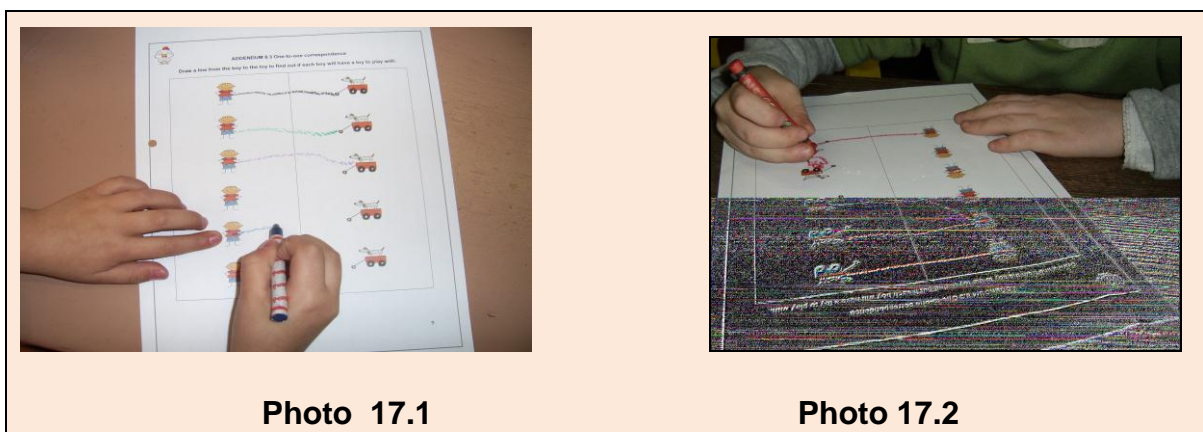
According to De Witt (2009:61), Patterson (2008:149), Papalia *et al.* (2008:199) and Lerner (2006:479), learners with visual-motor and visual-perception difficulties will not be able to identify geometric shapes as a complete and integrated entity, but will see them as unrelated lines (*cf.* Appendix 2: Session 4-7). This can be problematic later on when also working with numbers (*cf.* 2.8.3).

Participant 5 demonstrated guessing behaviour or simply said, “I don’t know”. He could not give logical answers and had no strategies for hypothetical thinking. It seemed that he did not understand instructions. His verbal delay impacted negatively on performance. This is in line with what Papalia *et al.* (2008:287) and Patterson (2008:297, 310-311) maintain in literature that if language delays are not treated in time, far-reaching cognitive, social and emotional consequences will occur (*cf.* 2.7.2).

Participant 5 could not think hypothetically and made visual decisions instead of cognitive decisions. With the assistance of the mediator, he could arrange the sticks from small to big – the same with the shapes (cf. Graph 5.13; Appendix 2: Sessions 5, 6). He could not estimate or predict how many shapes he required to complete the figure. He could not build the figure according to the example.

He became very confused when he was introduced to numbers (cf. Graph 5.13; Appendix 2: Sessions 8-10). With the one-on-one correspondence activity (cf. Photo 5.4.17.1), he started in the middle and worked from right to left – with each object the mediator had to tell him to work from left to right and top to bottom. I also had to remind him of the correct pencil grip (cf. Photo 5.4.17.2). Although he could group the Smarties according to colour, he experienced difficulty when he had to count them and complete the graph. With mediation and motivation his performance improved slightly.

**Photo 17: One-on-one correspondence and pencil grip**



Participant 5 enjoyed playing with the clay and forming letters, but did not want the mediator to show him how to form sounds correctly – he wanted it his way. He could not hear the resemblance between rhyme words “*mat rat cat*” (cf. Graph 5.13; Appendix 5).

Although he enjoyed Session 7 where he had to fit pieces into a shape, he could not logically explain why they fitted in the shape. He did not plan this activity at all – he randomly tried to fit the pieces into the shapes (cf. Graph 5.13; Appendix 5).

His memory performance (*cf.* Graph 5.15) was deficient. He could remember **4** of the **24** pictures (*cf.* Graph 5.15; Appendix 4). After mediation 1, he could remember **8** of the **24** pictures and after mediation 2 he could remember 1 of the 24 pictures. He did not want to continue with the memory game. During Session 12 (*cf.* Graph 5.13; Appendix 5) where he had to categorise animals and try to remember the animals he saw during the activity he could remember **4** of the **24** pictures. He totally blocked mediation and no longer wanted to play the memory game (*cf.* Graph 5.13; Appendix 5). Because he could not name all the animals, he experienced difficulty in grouping them. He also did not plan the direction activity. When young learners feel that experiences are beyond their control, they become anxious and depressed. This can also result in a learner who lets his behaviour interfere with his learning or with the learning of others (*cf.* 2.7.4.2) (Lerner & Johns, 2009:191; Nieman & Pienaar, 2006:94; Lerner, 2006:527).

I assume that Participant 5 developed from **Deficient (0)** cognitive functions where he passively accepted the demands of the mediator, to **Dependent (2)** cognitive functions in the Elaboration Phase where he sometimes responded to tasks and mediation (*cf.* Table 6.1) (Benjamin, 2009).



### Output Phase

Participant 5 utilised no clear and precise language and lacked adequate verbal tools to verbalise his thoughts and ideas (*cf.* Graph 5.13; Appendix 5). He could not communicate data and information in a precise and accurate way. According to Lerner & Johns (2009:265) and Lerner (2006:342-343), learners who have deficient oral receptive language cannot understand the meaning of a single word or even sentences. Such a learner might be able to understand a single word such as *cat*, but find it difficult to understand the instruction: “*Colour the cat who sits in front of the box with your red crayon*” (*cf.* 2.7.2).

Participant 5 experienced extreme problems with understanding and carrying out instructions, therefore he could not perform well. He struggled with labelling the pictures (*cf.* Appendix 4; Appendix 5; Appendix 4.3). Lerner and Johns (2009:354)

maintain that learners who cannot name objects quickly and automatically and are slow in recalling the correct words may have **rapid automatised naming (RAN)** and **word finding** problems(*cf.* 2.7.2). This may be an indication of later reading and learning disabilities, as well as a lifelong source of difficulty in reading, learning and using expressive language. This is caused by memory retrieval problems which make it difficult to access verbal information (Lerner & Johns 2009:354). According to Eggen & Kauchak (2010:146), language and speech disorders affect learning negatively (*cf.* 2.7.2). Young learners are supposed to communicate quite well on entering school, but some learners continue to experience problems expressing themselves. The causes of language disorders include (*cf.* 2.7.2) (Eggen & Kauchak, 2010:146):

- ☹ hearing loss;
- ☹ brain damage;
- ☹ learning disabilities;
- ☹ intellectual disabilities;
- ☹ severe emotional problems; and
- ☹ inadequate developmental experiences in a child's early years.

In Participant 5's situation it is therefore possible that his language disorders might be due to learning and intellectual disability, emotional problems and inadequate developmental experiences in his early childhood years.

He demonstrated egocentric behaviour by telling me about somebody who did not treat him well. I could not hear the name because of extremely poor speech and pronunciation. He showed a very poor attention span and talked about his own experiences (*cf.* Graph 5.13; Appendix 5; Appendix 3.24). During the second post-test he demonstrated less egocentric behaviour, but blocked out mediation (*cf.* Graph 5.14; Appendix 3.3). He did not want to follow instructions, became angry if I asked him to follow the instructions – he wanted to build unifix blocks his way and not according to the instructions (*cf.* Graph 5.13; Appendix 5).

Participant 5 did not listen to or understand instructions properly and worked in a trial and error way without being aware of his mistakes. He did not learn from his impulsive

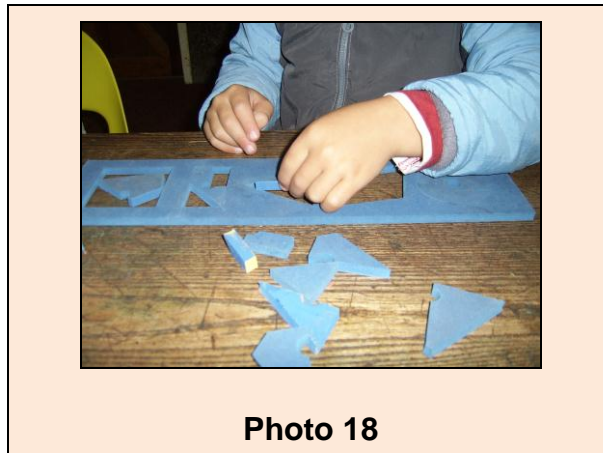
working ways, because he repeated mistakes repeatedly. A young learner is supposed to learn from his mistakes (*cf.* 2.5). He had a short attention span and I constantly had to bring him back to the task at hand (*cf.* Graph 5.13; Appendix 5).

Although he totally blocked out mediation, probably due to feeling incompetent (*cf.* 2.10.4.2) (Lerner & Johns, 2009:190; Nieman & Pienaar, 2006:94; Lerner, 2006:527), he sometimes became more open, especially when activities did not demand verbal skills, such as Session 7 (*cf.* Appendix 5) where he had to physically manipulate shape pieces to fit into a bigger shape.

Participant 5's virtual relationships were not in place and he did not understand principles. He did not argue logically, e.g. in the transfer activity (*cf.* Graph 5.13; Appendix 5) he put the *cheese* in the *circle* instead of the *triangle*, because he argued the cheese was yellow, the sun was round, therefore the cheese fitted in the circle. He could not work from outside the working space to the working space, therefore he struggled with transferring rules from one situation to another. He could not utilise visual examples to build a construction (*cf.* Graph 5.13; Appendix 5), because he could not associate the size of the shape with the function of the object, e.g. small circles should be used for the wheels of the train. He could not work with various modalities, e.g. from the picture, to the dot, to the number (*cf.* Graph 5.13; Appendix 5) and became very irritated if things did not go his way.

I constantly reminded him of rules and suggested strategies, but he did not apply them. The more difficult the activities became the more negative he behaved. Although his Output Phase was not good, he performed better in concrete activities than in verbal and numeric internalisation tasks since he had a preference for concrete activities in contrast to numerical modalities (*cf.* 5.4.1.1; Photo 5.4.18; Graph 5.13; Appendix 5).

**Photo 18: Concrete activities**



It can be assumed that Participant 5 developed from *Deficient (0)* cognitive functions where he passively accepted instructions of the mediator, to *Inadequate (1)* cognitive functions in the Output Phase where he sometimes responded to tasks and mediation (cf. Table 5.1) (Benjamin, 2009).



**Non-intellective factors**

Participant 5 passively withdrew from learning, which may be an indication that he most probably encountered negative experiences regarding learning in the past (cf. 2.7.5) (Tzuriel, 2002:72). I suspect he is emotionally immature (cf. 2.8) (Lerner & Johns, 2009:190; Nieman & Pienaar, 2006:94; Lerner, 2006:527). He seemed bored, yawned continuously and said he did not want to work. As soon as it was expected of him to comply with certain instructions and rules, he became negative and blocked out mediation. He displayed no perseverance to complete a task and could not work independently. He had no intrinsic motivation, and experienced no pleasure in the task and easily gave up hope. Sometimes he did not even want to try (cf. Graph 5.13; Appendix 5). He preferred practical work if it was on his terms and did not care if he completed tasks at hand correctly or incorrectly (cf. Graph 5.13; Appendix 5).

Participant 5 did not demonstrate good locus of control. He was very passive and I constantly had to bring his attention back to the work at hand. Sometimes he became

aggressive if things did not go his way. He did not show any control over what he wanted to do and what he was supposed to do. He exhibited a low frustration tolerance, because he said, “I don’t know” even before he started with an activity. He did not follow rules and instructions, became extremely frustrated, and even broke the crayons if things did not go his way. He lost interest easily and then became aggressive. This behaviour is in line with the view of Lerner and Johns (2009: 187-188) and Lerner (2006:522-524) that learners exhibit difficult behaviour in a learning environment in order to avoid aversive academic tasks (*cf.* 2.7.4.2).

If he was unable to execute an activity, he compensated by being difficult. This behaviour correlates with what literature states regarding the relationship between academic underachievement and externalising behaviour (Lerner & Johns, 2009: 187-188; Lerner 2006:522-524).

From the above it is possible to derive that Participant 5 demonstrated a **very low** level of modifiability, since he required on-going explanation, did not recall information, needed ongoing concrete modelling of the answers and was fully dependent on the mediator(*cf.* Table 5.1) (Benjamin, 2009). He progressed from **Deficient (0)** to **Inadequate (1)** with regard to Non-intellective factors.



## Reflection

As a result of the task demands (activities) in the **CEPP** (*cf.* Appendix 5), deficient cognitive areas in Participant 5 could be addressed, adjusted and modified. Due to his **unsystematic, impulsive and inaccurate** working behaviour (*cf.* Appendix 5) he made numerous and unnecessary mistakes that affected his performance during the intervention, and this will also impact negatively on future performance in a formal teaching setting, such as Grade 1, if not rectified. He also tended to “forget” **rules and strategies** and struggled to **solve problems** due to his impulsive behaviour during Sessions 1-6 (*cf.* Appendix 5). He also did not **verify** his work (*cf.* Appendix 5) which contributed to unnecessary mistakes. Participant 5 also experienced difficulties in **predicting** answers and solutions and did not display hypothetical thinking (*cf.*

Appendix 2: Sessions 1-6). He could not **focus** on an activity and had difficulty in **remembering** objects he had seen (*cf.* Appendix 5). His **verbal tools** were not good and he did not only struggle with identifying sounds, but also found it difficult to express himself (*cf.* Appendix 5). This might be an indication that his **auditory discrimination** was not sufficiently developed. All these factors deprived him from performing well in the pre- and post-tests (*cf.* Appendix 5; Appendix 3.2; Appendix 3.3) and may prevent him from reaching his potential in his school career, if not resolved in time (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

Participant 5 blocked mediation, because non-cognitive factors such as genetic, personality, parenting style and motivation factors caused his blocking behaviour and impacted on his mediation possibilities (Lerner & Johns, 2009: 187-188; Lerner 2006:522-524, Feuerstein *et al.*, 2002:520; Tzuriel, 2002:74) (*cf.* 2.8). He showed inconsistent behaviour. On some days he performed better than on others. He became aggressive and irritated when the mediator tried to assist him in completing a task. He could not cope with more than one instruction or object at a time, but performed “better” if he could focus on one task and one object at a time.

### 😊 **Task demands**

The task demands in the **CEPP** (*cf.* 6.4.2) assisted in rectifying Participant 5’s cognitive deficiencies and replaced his impulsive and unorganised behaviour with self-regulation by means of planned comparative behaviour, verbal tools and hypothesis-testing techniques.

### 😊 **Content**

The **Content** in Session 1 of the **CEPP** required participants to recognise basic colours, such as blue, green, red, yellow, white, black and orange. Participants had to compare and classify the colours, learn new vocabulary, give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** assisted Participant 5 to identify colours and categorise objects according to colour. Although his speech was unclear, he could name the different colours. He experienced great difficulty in

explaining his thoughts and decisions and depended strongly on my assistance. He could not come up with solutions for problems and nodded his head when I guided him to a solution. (cf. Graph 5.13; Appendix 2: Session 1).

The **Content** in Session 2 of the **CEPP** required participants to recognise basic colours, seriate and create patterns with their coloured disks. Participants had to recognise the colours, learn new vocabulary (e.g. *pattern*), give explanations regarding their actions and offer solutions. Participant 5 could recognise basic colours, but found it difficult to create a pattern completely, e.g. he would put out blue, red, red, yellow, but from there on got confused and completed the pattern incorrectly, e.g. blue, red, yellow. With mediation and assistance, I helped him to correctly complete the pattern by indicating his mistakes. The task demands in Session 2 definitely developed Participant 5's seriation skills, expanded his vocabulary (e.g. *pattern*), but he still could not explain his actions. However, when I asked him later in the session what a pattern was, he could not remember (cf. Graph 5.13; Appendix 2: Session 2).

The **Content** in Session 3 of the **CEPP** required participants to recognise basic colours, and determine the position of objects in relation to other objects. Participants had to learn new vocabulary (e.g. *above, behind, next to*, etc), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** assisted Participant 5 with his spatial orientation and expanded his vocabulary but he still struggled to explain his decisions and come up with solutions (cf. Graph 5.13; Appendix 2: Session 3).

In Session 4 the **Content** once again entailed colour recognition, comparison, classification, vocabulary (*more or less*, etc.), explanations and solutions. In this session new content, namely number quantity was addressed. Participants had to count the Smarties they received, categorise them in groups (according to colour), and determine which group contained the most sweets and which the least. Participants then had to put the Smarties on a graph (cf. Appendix 2: Session 4). Participant 5 found task demands containing numbers extremely difficult. With mediation I helped him to count every Smartie separately. He could not estimate which group contained the most Smarties or which the least. He could still not share his thoughts and could not give any

solutions in this session and although he was not eager to explain his decisions and give solutions, he began to share his thoughts (*cf.* Graph 5.13; Appendix 2: Session 4).

The **Content** in Session 5 involved colour recognition, vocabulary (triangle, rectangle, circle, square, and diamond), explanations and solutions. New content with regard to shape recognition, direction (left, right, next to, above, behind) and sequence was dealt with. Participants physically explored the characteristics of the various shapes (curved line, four equal sides, etc). Although the characteristics of shapes were repeated numerous times on a concrete level where they had to jump, walk, crawl on big shapes and physically touch the shapes, Participant 5 could not remember the characteristics of the shapes (e.g. the circle has curved lines, the triangle has three corners, etc.). He also struggled to distinguish between the square and the rectangle, but could identify the diamond. The task demands in Session 5 contributed positively to the slight improvement in Participant 5's cognitive functions. He just needed much more time and repetition (*cf.* Graph 5.13; Appendix 5).

In Session 6 the **Content** entailed shape recognition, relationships between shapes, comparing shapes, vocabulary such as *big, small, medium, big, bigger, biggest*, etc. Participants had to arrange the wooden shapes according to size and explain what they did and why they arranged them the way they did. Participants also had to build 3D constructions where they had to plan which shapes, how many shapes and what size shapes they would need. During Session 6 Participant 5 also had to give explanations and offer solutions. The task demands of Session 6 assisted him to work in a more systematic way. He thoroughly enjoyed playing with the wooden shapes and wanted to build and arrange the shapes in different constructions and patterns. I strongly believe that if I could have worked with Participant 5 individually over a longer period, where he could have developed at his own slow pace without time pressures, some of his cognitive functions could have been rectified and instilled (*cf.* Graph 5.13; Appendix 5).

The **Content** in Session 7 involved recall regarding colour, shape, relationships and characteristics of shapes. Participant 5 could recall the colours and shapes, and could, with mediation, recall the characteristics of the triangle, circle, rectangle and square. He performed well in Session 7 where he had to assemble shape pieces to create a

specific shape. Although he could fit single parts of the shape, he could not explain why. Although his speech was unclear, I am positive that the task demands in Session 7 helped him to compare (*cf.* Graph 5.13; Appendix 5).

The **Content** in Session 8 required participants to discuss picture cards, categorise counters (according to colour), determine the amount of counters, count them and match them to a counter, dot card, picture, and number name. While counting, the one-to-one-correspondence concept was also instilled. Participant 5 received the opportunity to explain how many more or less counters he had and what he could do to make the counters equal. Participants also had the opportunity to pose simple problems regarding more or less. I immediately realised that the task demands in Session 8 were above Participant 5's comprehension, since it entailed numbers. He became extremely difficult and I had to adapt all the activities to his level of understanding. He could not, compare, estimate, explain or offer solutions. He could not arrange the counters, picture cards, dot cards and number cards from one to ten (*cf.* Graph 5.13; Photo 5.4.14; Appendix 5).

The **Content** in Session 9 required participants to compare counters, determine quantity, do simple addition sums and determine more or less. New vocabulary, such as *plus, more, put together, equal, estimate*, was learned. Since Participant 5 totally blocked out when numerical modalities were involved, I also adapted the activities in Session 9 to his level of comprehension. The task demands in Session 9 helped Participant 5 to match a counter with a picture, a dot card and a number card and arrange them from one to ten, although he completed the activity on his terms (*cf.* Graph 5.13; Photo 5.4.14; Appendix 5).

Session 10's **Content** included tasks demands, such as comparing counters, breaking down numbers, determining quantity, doing simple subtraction sums, determining more or less, giving explanations and offering solutions. New vocabulary, such as *minus, subtraction, less, take away, equal, estimate*, was learned. Due to Participant 5's lack of numerical ability, he once again tried to put out the counters from one to ten and match the counters with the picture cards, dot cards and number cards. Although he could not complete the addition (*cf.* Appendix 5) and subtraction (*cf.* Appendix 5) activities, the

task demands in Session 8 were repeated and he could complete the activity, which was unquestionably a huge step forward (*cf.* Graph 5.13; Photo 5.4.14; Appendix 5).

In Session 11 participants had to identify sounds already learned in their classroom setting. Since Participant 5's language ability was defective, he experienced great difficulty in attaining the task demands of this session. He could not identify already learned sounds, could not identify the beginning, middle and end sounds of three-letter words and could not understand the concept of rhyme words. With mediation he could complete the missing sound in a three-letter word, e.g. r a \_(t), which once again confirmed my intuition that if unceasing mediation could be done with Participant 5 on individual level (and on his level of development), his cognitive functioning could be developed and optimised. Although he still needed extensive practice in language skills, the task demands in Session 11 will undoubtedly contribute to improved language skills, letter recognition, building up three-letter words, breaking down three-letter words, auditory discrimination, identifying beginning, middle and end sounds, comparing relationships between three-letter words and sounds, identifying rhyme words, giving explanations and offering solutions, if presented over a longer period (*cf.* Graph 5.13; Appendix 5).

The **Content** in Session 12 facilitated participants' direction, visual memory, categorisation, vocabulary, explanation and problem-solving capacity. The task demands in Session 12 were once again above Participant 5's problem solution ability. He could however complete the activity on direction which was an indication that the task demands in Session 12, entailing comparing similarities and differences, assisted him in successful completion of the activity. The task demands also addressed and developed his spatial orientation. He still could not (and did not want to) give explanations and solutions to problems, due to his language deficiency (*cf.* Graph 5.13; Appendix 5).

### 😊 **Modalities: Sessions 1-12:**

**The modalities** utilised in Sessions 1, 2, 3, 5, 6, 7, 11 and 12 were figural, pictorial, verbal and symbolic. The modalities utilised in Sessions 4, 8, 9 and 10 included

numerical modality. Participant 5 preferred and performed better in pictorial and figural modalities.

## 😊 Phases

Since the **Input Phase** demanded accurate gathering of information, need for precision and accuracy, considering two or more sources of information, clear perception, receptive verbal tools and spatial and time orientation, activities presented during Sessions 1 – 12 addressed all of the above and enabled Participant 5 to develop throughout the **CEPP** from deficient to fragile in the Input Phase (*cf.* Graph 5.13; Appendix 5).

During the **Elaboration Phase**, participants' planning behaviour, selection of relevant cues to solve a problem, summative behaviour, pursuing logical evidence, hypothetical thinking and strategies, internalisation, memory, categorisation, comparison, problem-solving and relationships were observed. All the activities in the **CEPP** from Sessions 1 to 12 attended to the above. These task demands contributed to the fact that Participant 5 developed from deficient to fragile in the Elaboration Phase.

Behaviour observed in the **Output Phase** comprised egocentric communication, blocking behaviour, visual transport, projection of virtual relations, transfer of rules, clear and precise language, impulsive behaviour, and precision and accuracy. The task demands in Sessions 1 to 12 of the **CEPP** all focused on the above which contributed to Participant 5's optimised ability in the Output Phase from deficient to fragile.

## 😊 Cognitive operations

Focus was placed on the following **Cognitive operations** in Sessions 1-12 of the **CEPP**: Categorisation, comparison, classification, planned systematic behaviour, problem-solving, hypothetical thinking, mental representation, seriation and critical reflection. Since some of the cognitive operations (categorisation, comparison, classification, planned systematic behaviour, problem-solving, and hypothetical thinking) were repeated in Session 2, Participant 5 had the opportunity to revise them but could not always apply them to the new cognitive operations, such as seriation and critical reflection (*cf.* Appendix 2: Session 1; Graph 5.14).

## 😊 **Complexity, Abstraction and Efficiency**

**Complexity, Abstraction and Efficiency levels** were low in Sessions 1-3, low to medium in Sessions 4-6, medium in Sessions 7-9 and medium to high in Sessions 10-12 (*cf.* Appendix 5).

I maintain cognitive functions that still **need practice** and **attention** will improve if the following principles of mediation are optimised frequently (*cf.* 3.6):

- ☒ **Mediation of individuation:** Participant 5 still struggled to work independently. I believe that, with mediation, he will be able to be less dependent on the mediator (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- ☒ **Mediation of regulation and control of behaviour:** Participant 5 could not work in a self-reflective, controlled manner, although there was a slight improvement in his planning behaviour (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- ☒ **Mediation of goal-seeking, goal-setting and goal-achieving behaviour:** Participant 5 found it difficult to set goals for himself and was not motivated to complete activities successful (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- ☒ **Mediation of transcendence:** Although Participant 5 experienced difficulty in applying rules and strategies he could remember to, for example, work from left to right and top to bottom (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- ☒ **Mediation of challenge:** Participant 5 could not meet all the challenges set by task demands, but I believe that if mediation could be done with him on a continuous basis, over a longer period of time, he will become better equipped to meet the

challenges set by task demands (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

- ☒ **Mediation of an awareness of the human being as a changing entity:** Participant 5 did not reflect on his work (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- ☒ **Mediation of the search for an optimistic alternative:** Participant 5 was not focused and did not realise that problems could be solved in various ways. He did not look for alternative solutions when presented with a problem and easily quit (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- ☒ **Mediation of meaning:** Participant 5 did not fully understand instructions and he did not possess the verbal tools to understand the meaning of concepts (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- ☒ **Mediation of a feeling of belonging:** Participant 5 demonstrated peculiar behaviour and became irritated easily, especially when he experienced failure (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- ☒ **Intentionality and reciprocity:** Participant 5 did not develop into a self-reflective learner and these characteristics should therefore be encouraged continuously (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:10; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

☒ **Mediation of sharing behaviour:** Participant 5 could not and did not want to explain his thoughts and actions to others and should be encouraged to share his thoughts spontaneously with others (Anon, 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

It is important for these functions to be infused on a continuous basis in all future learning activities in order to be retained (*cf.* 5.4.1.1) (Feuerstein *et al.*, 2002:526). In doing so, the problematic cognitive functions could be eliminated.

Participant 5 completed the first pre-test in **40** minutes and scored **8**. The first post-test was completed in **45** minutes and he scored **9**. The second pre-test took him **50** minutes to complete and he scored **12** points. He did not want to complete the second post-test and he scored only **8** points. The delayed post-test took him **59** minutes and he scored **9** (*cf.* Graph 5.14), which means that to an extent the **CEPP** contributed to Participant 5's slight improvement in efficiency, his rapid response, and the precision and energy he put into the tasks (*cf.* 5.4.1) (Feuerstein *et al.*, 2002:134-136).

A slight improvement in the nature and quality of cognitive change (*cf.* 5.4.2; Figure 6.4) in Participant 5 was evident (*cf.* 5.4.1) and he showed some progress in planned working ways. He still struggled to apply strategies and rules learned (*cf.* 5.4.2; Figure 6.4).

It seems that to some extent Participant 5 did sometimes react positively to mediation but that his cognitive deficiencies definitely contributed to his lack of positive participation and blocking behaviour. The fact that Participant 5 could not communicate at all should also be taken into account when considering his poor performance as well as that he favoured activities in pictorial and figural modalities. It appears that Participant 5 will flourish in a very small classroom ( five to eight learners) seated with learners who experience similar learning barriers , in order for the teacher to teach and mediate her learners at a slow pace. It would also be beneficial to him if his parents could take part in the mediational process at home. Table 5.5 compares Participant 5's cognitive modifiability in Session 1 with the cognitive modifiability in Session 12 based on the observations and test results. My cautious suspicion is that Participant 5 (🐼)

may come from a permissive environment, since he remained resistant to cognitive challenges throughout the intervention (*cf.* 2.7.6; Table 2.5) (Eggen & Kauchak, 2010:64).

## 2.6 PROFILE: PARTICIPANT 6



### Input Phase

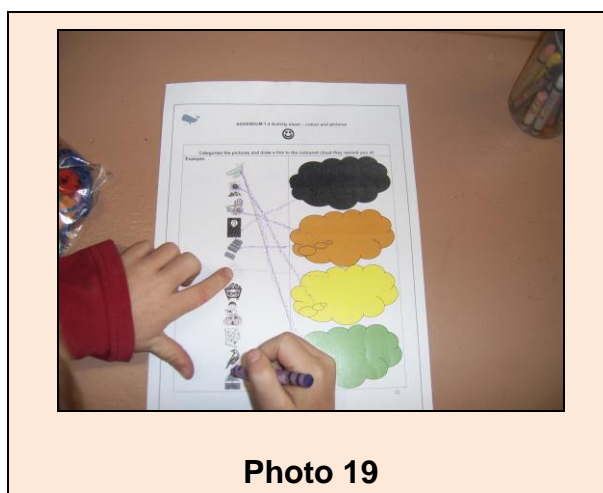
During the pre-test and the first four sessions of the intervention, Participant 6 possessed no systematic thinking or behaviour **CEPP** (cf. Graph 5.16; Graph 5.17; Appendix 2: Session 1-4). He had no working strategies, and displayed vague and sweeping perceptions. He showed impulsive behaviour and lacked precision and accuracy. This links to the views of Epstein (2008:40); Lerner (2006:188) and Rivken, (2002:37) that impulsive learners do not perform as well at school as reflective learners (cf. 2.2.3.1). He hurried through activities and therefore did not work accurately, e.g. the cat and box activity sheet, where he over-eagerly crossed out the wrong picture without thinking carefully about the instruction (cf. Graph 5.16; Appendix 2: Session 3). This correlates with what Benjamin (2009), Feuerstein *et al.* (2007:23,24) and Tzuriel (2001:50-55, 72-73) state regarding deficient cognitive functions, as discussed in Chapter 2, that culminate in unplanned, unsystematic and impulsive exploratory behaviour (cf. 2.4). During the last post-test he showed good progression. Although I had to remind him to check his work, he remembered the rules and showed the potential to become a systematic worker.

Participant 6 could identify which group of Smarties contained the most sweets and which the least, but he did not count systematically. After mediation he worked more systematically (cf. Graph 5.16; Appendix 2: Session 4). He could make relations and associations. He first put out the numbers, then the dots and lastly the pictures (cf. Graph 5.16; Appendix 5). He was influenced by the group member's disruptive behaviour and therefore did not listen to instructions.

For Session 11 and Session 12 I put Participant 6 with another group member due to the extremely disruptive behaviour of Participant 7. He then performed and concentrated much better (cf. Graph 5.16; Appendix 2: Sessions 11-12).

Participant 6 could compare two objects accurately and process information. However, he could not identify *donkey*, *dress*, *triangle*, *rectangle*, *square* and *carrot* (cf. Appendix 3.1). He tended to be very quiet, but communicated better after being separated from Participant 7 (cf. Graph 5.16; Appendix 2: Sessions 11-12). During Session 1 he could identify the coloured clouds and link the colour to a picture (cf. Photo 5.4.19). He also explained his answers.

**Photo 19: Relationship between colour and picture**



He experienced difficulties with the transfer problem in Session 3 where he could not see that the same pictures should fit in the same houses. He also pasted his pictures upside down (cf. Graph 5.16; Appendix 2: Session 3). He could name the shapes and their characteristics. He understood the concept of patterning and could create his own pattern with the shapes (cf. Graph 5.16; Appendix 5).

Participant 6 enjoyed working with numbers and could count up to ten and backwards easily. He had a good number concept and he understood the one-on-one correspondence well. With mediation he could explain that addition is the same as putting together and making more and he could explain the concept subtraction (cf. Graph 5.16 ; Appendix 5 & 10).

He also experienced difficulty in recognising sounds and pictures (cf. Graph 5.16; Appendix 5). He could not name objects that start with a specific letter, e.g. "*tent*, *tien*, *toon*". He could identify some of the sounds (a, m, s, f, r, e, n, h, l, k) but could not

identify “g, t, b, p, d”. He struggled to identify sounds at the beginning, middle and end of a three-letter word (*cf.* Graph 5.16; Appendix 5). After mediation, the beginning and end sounds improved, but he still struggled with the middle sound, e.g. “*b-u-s*”. Learners who experience difficulty in learning to read are unable to recognise or isolate the sounds of words or the number of sounds in a word, as was the case with Participant 6. These learners have trouble with phonological awareness and will encounter problems with reading and spelling (*cf.* 2.10.2) (Lerner & Johns, 2009:265). Literature advocates the importance of the development of phonological awareness during the pre-school years before learners are taught to read (Lerner & Johns, 2009:265-266; Lerner, 2006:341-342). He also found it difficult to identify rhyme words, such as *mat* and *rat*, which means that Participant 6 could not recognise similarities in words. After mediation he could complete the activity (*cf.* Figure 5.3; Appendix 5). In Session 12, where he had to name and categorise the animals in groups, he could not name the *tiger* and the *ladybird* (*cf.* Graph 5.18; Appendix 5).

During the pre-test and the first four sessions of the intervention programme he was able to only consider two sources of information at the same time (*cf.* Graph 5.16, 5.19; Appendix 2: Session 1-4). This skill developed throughout the intervention programme. During the last post-test and delayed post-test he could easily compare objects simultaneously and was able to notice differences and similarities in shapes, letters, numbers and pictures (*cf.* 2.3). This statement shows relation with literature (Eggen & Kauchak, 2010:40; Papalia *et al.*, 2008:269,270; Van Staden, 2005:53.54) regarding pre-school learners’ classification and categorisation skills (*cf.* 2.3).

Although he planned more systematically, he still worked impulsively at times, e.g. he continued to work in an organised way for a few items and then fell back to unsystematic working ways (*cf.* Graph 5.16; Appendix 5). He showed progression because decreased mediation was necessary.

Although Participant 6 understood the concept of patterning, he still made mistakes. With mediation he made use of finger tracking but due to impulsiveness he continued to make mistakes (*cf.* Graph 5.16; Appendix 2: Session 2).

During Session 5 he struggled to classify the shapes but with mediation he could compare and consider two sources of information simultaneously (*cf.* Graph 5.16; Appendix 5). He could arrange groups according to colour and shapes, but struggled with the arrangement of the shapes from big to small (*cf.* Graph 5.16; Appendix 5).

Because of over-eagerness he sometimes completed activities incorrectly (*cf.* Graph 5.16; Appendix 5-10). According to (Benjamin, 2009; Feuerstein *et al.*, 2007:23, 24; Tzuriel, 2001: 50 – 55; 72-73), learners who experience problems with accuracy and a need for precision have deficient cognitive functioning in the Input Phase, which may continue in the Elaboration and Output Phases if not dealt with in time (*cf.* 2.4.1) After mediation, where I delayed his response while providing him with opportunities for considering all aspects of the problem, he could work more systematically, especially during the last post-test and the delayed post-test. His verbal skills improved and he could explain his answers. It appears that his openness to mediation contributed to his progression. He possessed good vocabulary and verbal skills which impacted positively on his performance (*cf.* 2.7.2) talk (Eggen & Kauchak, 2010:146; Lerner & Johns, 2009:353-355). Although his inferential thinking was emerging, he realised he should work accurately (*cf.* Graph 5.16; Appendix 5).

It appears that Participant 6 developed from **Deficient (0)** cognitive functions where he was encouraged to apply or transfer already learned rules to other areas of content, to **Self-regulated (7)** cognitive functions in the Input Phase, where he could apply previously used and semi-internalised strategies and reflect on his work (*cf.* Table 5.1) (Benjamin, 2009).

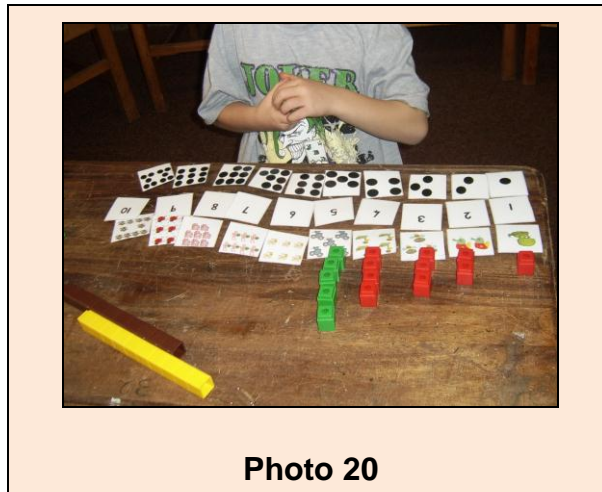


### Elaboration Phase

Initially Participant 6 could not identify a starting point when solving problems (*cf.* Graph 5.16; Appendix 2: Sessions 1-4). He also did not work according to rules. No summative behaviour was present, because he did not estimate how many and which shapes he would need to complete his 3D construction (*cf.* Graph 5.16; Appendix 2: Sessions 5, 6). He did not approach his work logically. After mediation, he began to

work more logically and started to select relevant information in order to solve a problem. From Session 8 onwards he could compare options before deciding on a final answer (cf. Photo 5.4.20; Graph 5.16; 3.6.2.5; Appendix 5).

**Photo 20: Logical and systematic working ways**



During the pre-test he could not compare objects but only made associations with objects, e.g. he made associations with *hat* and *circle* and *apple* due to the round shapes, and *cat* and *bed*, because the cat sleeps on the bed (cf. Appendix 4). He could not select relevant cues for solving a problem and had difficulty in identifying a starting point when solving problems (cf. Graph 5.16; Appendix 2: Sessions 1-4). After mediation where I showed him to look for alternatives, he began to select cues. He experienced difficulty in identifying rhyme words, but after mediation, he was able to identify words that sounded the same. He found the analysis and synthesis of words very difficult (cf. Figure 5.3; Appendix 5).

Participant 6 found it difficult to think abstractly about the steps he should take to complete an activity (cf. Graph 5.16; Appendix 2: Sessions 1-4). Initially he did it concretely; saw his mistake before he corrected it. He showed trial and error behaviour. After a few intervention sessions, he could identify his mistake and correct it (cf. Graph 5.16; Appendix 2: Session 6-12). This behaviour was also evident in the last post-test.

He enjoyed working with numbers and understood the concept of addition and subtraction. He could do the classification with number, dot and picture. At first he

completed activities randomly, later on he displayed the need to rethink his final answer – this had not been present in Sessions 1-5 (cf. Appendix 5).

During Session 5 (cf. Graph 5.16; Appendix 5) Participant 6 could identify shapes hidden in a bag, and was able to explain the characteristics of the shapes. From Session 8 onwards he could find a strategy to find the answers (cf. Graph 5.16; Appendix 5). His hypothetical thinking seemed to be better when doing non-verbal activities. When I reminded him, he approached tasks more systematically. He was not able to associate the function of an object with the size of the shapes, e.g. small circles to make the wheels and the big circle to make the head of the man – the same with the rectangles (cf. Graph 5.16 ; Appendix 5). During the last post-test and the delayed post-test, he could explain his answers (cf. Graph 5.17; Appendix 3.2 & 3.3).

At first he could not explain his answers and could not communicate his thoughts. He had no step by step working procedure, could not find a strategy to solve problems and could not predict an outcome (cf. Graph 5.16; Appendix 2: Session 1-4), but after a few intervention sessions he was confident in his answers, was able to logically explain them, started to work more systematically and searched for strategies (cf. Figure 5.3; Appendix 2: Sessions 5-12). He was able to see the difference between shapes, and could verbalise the difference between a rectangle, square, triangle and circle (cf. Graph 5.16; Appendix 2: Sessions 5-6).

Initially his memory performance (cf. Graph 5.18) was fragile. He could remember **4** of the **24** pictures (cf. Graph 5.18; Appendix 4). After mediation 1 he could remember **17** of the **24** pictures and after mediation 2 he could remember **13** of the **24** pictures. During session 12 (cf. Graph 5.18; Appendix 5) where he had to categorise animals and try to remember the animals he saw during the activity, he could remember **3** of the **24** pictures. After mediation he could remember **21** of the **24** pictures (cf. Graph 5.18; Appendix 5). He showed progression in hypothetical thinking and internalising his thoughts (cf. Appendix 7).

It seems probable that Participant 6 developed from **Deficient (0)** cognitive functions where he spontaneously responded to tasks and mediation, to **Adequate (6)** cognitive

functions in the Elaboration Phase where he applied previously used and semi-internalised strategies and reflected on his work (*cf.* Table 5.1) (Benjamin, 2009).



## Output Phase

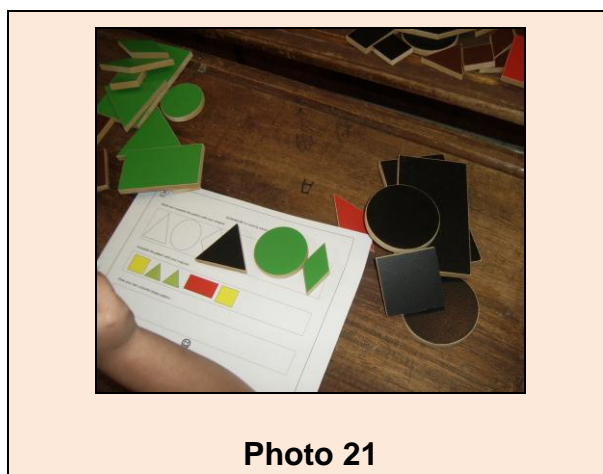
Because of mediation Participant 6 could identify a starting point from Session 7 onwards, even though he sometimes still showed impulsive behaviour. (*cf.* Graph 5.16; Appendix 5). This compares with what literature says regarding MLE that can turn a cognitive deficient learner into an independent and self-regulating learner (*cf.* 2.7.2.5) (Anon., 2008b; Fraser, 2006:9; Feuerstein, 1980:22).

Initially he did not learn according to rules and therefore gave a lot of trial and error responses. He struggled to think abstractly and still needed to figure things out concretely (*cf.* Graph 5.16; Appendix 5). From Session 8 (*cf.* Graph 5.16; Appendix 5) onwards he started to apply rules and strategies of what he had learned.

Although he was eager to complete the activities he sometimes still made mistakes, because he did not think about his answers. This is in line with what literature maintains regarding meta-cognition which is still emerging in the young learner between the ages of four and six (*cf.* Chapter 2.2.2) (Robson, 2006:84; Botha *et al.*, 1990:276).

He enjoyed working with numbers and could give examples of where one can use addition and subtraction, e.g. buying or losing something (*cf.* Graph 5.16; Appendix 5, 9, 10). He could create his own pattern of shapes (*cf.* Photo 5.4.21) and worked easily from outside the working space to the working space (*cf.* Graph 5.16; Appendix 5).

**Photo 21: Shape patterns**



No deficiency of visual transport was present. He could visualise change of directions, relations and connections internally when completing the activity where he had to match vehicles from various directions (*cf.* Graph 5.16; Appendix 5). Although he understood the principle of virtual relations, he sometimes still projected it incorrectly (*cf.* Graph 5.16; Appendix 2: Session 2) but showed signs of progression from Session 5 onwards (*cf.* Graph 5.16; Appendix 2: Sessions 5-12).

Participant 6 never showed any sign of blocking behaviour. It appears that he developed from **Deficient (0)** cognitive functions where he spontaneously responded to tasks and mediation, to **Autonomous (8)** cognitive functions in the Output Phase where structural change was constantly present and evident (Table 5.1) (Benjamin, 2009).



**Non-intellective factors**

Participant 6 was open to mediation. He never rejected my attempts to teach him. He did not show signs of previous negative experiences with a mediator or with learning, because he never withdrew passively from learning. He showed persistence on tasks and intrinsic motivation to complete activities successfully. He could work independently and became more aware of his own thinking (*cf.* Chapter 2.2.2). He constantly showed positive behaviour and no frustration was present. From Session 7 onwards he showed more control over the execution of tasks and wanted to work out problems (*cf.* 2.2.2;

Graph 5.16; Appendix 5). He was confident in his answers during the last post-test and delayed post-test, showed no fear of failure and expressed a high level of energy, vividness, attentiveness and interest.

Participant 6 showed a **medium to high** level of modifiability, since he required less explanations and prompts to recall learning from previous learning experiences (*cf.* 5.4.1.3; Table 6.1). He progressed from **Deficient (0)** to **Independent (9)** regarding Non-intellective factors and was also able to transfer learning and apply strategies (*cf.* Graph 5.16; 5.17).



### Reflection

As a result of the task demands (activities) in the **CEPP** (*cf.* Appendix 5), deficient cognitive areas in Participant 6 could be addressed, adjusted and modified. Due to his **unsystematic, impulsive and inaccurate** working behaviour (*cf.* Appendix 2: Session 1-5) he made numerous and unnecessary mistakes that affected his performance during the study, and that will also impact negatively on future performance in a formal teaching setting, such as Grade 1, if not rectified. He also tended to “forget” **rules and strategies** and struggled to **solve problems** due to his impulsive behaviour during Sessions 1-6 (*cf.* Appendix 2: Sessions 1-6). He also did not **verify** his work (*cf.* Appendix 5), which contributed to unnecessary mistakes. Participant 6 also experienced difficulties in **predicting** answers and solutions and did not display **hypothetical thinking** (*cf.* Appendix 2: Sessions 1-6). He could not **focus** on an activity and had difficulty in remembering objects he had seen (*cf.* Appendix 2: Sessions 1-6). Although his verbal tools were good, he struggled with identifying sounds (*cf.* Appendix 5), which may be an indication that his **auditory discrimination** was not sufficiently developed. All these factors disadvantaged him from performing well in the pre-test (*cf.* Appendix 4.4) and may prevent him from reaching his potential in his school career, if not resolved in time (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais,

2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

### 😊 **Task demands**

The task demands in the **CEPP** (cf. 6.4.2) assisted in rectifying Participant 6's cognitive deficiencies and replaced his impulsive and unorganised behaviour with self-regulation by means of planned comparative behaviour, verbal tools and hypothesis-testing techniques.

### 😊 **Content**

The **Content** in Session 1 of the **CEPP** required participants to recognise basic colours, such as blue, green, red, yellow, white, black and orange. Participants had to compare and classify the colours, learn new vocabulary, give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** optimised Participant 6's classification abilities and expanded his vocabulary (he had to name objects of specific colours). Since Participant 6 was not eager to verbalise his solutions, I motivated him continuously to explain his thoughts (cf. Graph 5.16; Appendix 2: Session 1).

The **Content** in Session 2 of the **CEPP** required participants to recognise basic colours, seriate and create patterns with their coloured disks. Participants had to recognise the colours, learn new vocabulary (e.g. *pattern*), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** developed Participant 6's seriation skills, expanded his vocabulary, but he still struggled to explain his decisions (cf. Graph 5.16; Appendix 2: Session 2).

The **Content** in Session 3 of the **CEPP** required participants to recognise basic colours, and determine the position of objects in relation to other objects. Participants had to learn new vocabulary (e.g. *above, behind, next to*, etc), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** further optimised Participant 6's spatial orientation and vocabulary. He started to verbalise his thoughts (cf. Graph 5.16; Appendix 2: Session 3).

In Session 4 the **Content** once again entailed colour recognition, comparison, classification, vocabulary (*more or less*, etc.), explanations and solutions. In this session new content, namely number quantity was addressed. Participants had to count the Smarties they received, categorise them in groups (according to colour), and determine which group contained the most sweets and which the least. Participants then had to put the Smarties on a graph (*cf.* Appendix 2: Session 4). Participant 6 performed well in this session and slowly began to share his thoughts (*cf.* Graph 5.16; Appendix 2: Session 4).

The **Content** in Session 5 involved colour recognition, vocabulary (triangle, rectangle, circle, square, and diamond), explanations and solutions. New content with regard to shape recognition, direction (left, right, next to, above, behind) and sequence were dealt with. Participants physically explored the characteristics of the various shapes (curved line, four equal sides, etc). Participant 6 performed well in this session (*cf.* Graph 5.16; Appendix 5).

In Session 6 the **Content** entailed shape recognition, relationships between shapes, comparing shapes, vocabulary, such as big, small, medium, big, bigger, biggest, etc. Participants had to arrange the wooden shapes according to size and explain what they did and why they arranged the wooden shapes the way they did. Participants also had to build 3D constructions where they had to plan which shapes, how many shapes and what size shapes they would need. During Session 6 Participant 6 explained his actions more easily and offered solutions verbally. The task demands of Session 6 optimised Participant 6's reflective behaviour (*cf.* Graph 5.16; Appendix 5).

The **Content** in Session 7 involved recall regarding colour, shape, relationships and characteristics of shapes. Participants had to assemble shape pieces to create a specific shape. Participant 6 systematically compared single pieces of shape to complete the activity. He explained his actions. (*cf.* Graph 5.16; Appendix 5).

The **Content** in Session 8 required Participants to discuss picture cards, categorise counters (according to colour), to determine the number of counters, count them and match them to a counter, dot card, picture, and number name. While counting, the one-to-one-correspondence concept was also instilled. Participant 6 could explain how

many more or less counters he had and what he could do to make the counters equal. Participants also had the opportunity to pose simple problems regarding more or less. The task demands in Session 8 enabled Participant 6 to count, compare, estimate, explain, offer solutions and learn new vocabulary (*cf.* Graph 5.16; Appendix 5).

The **Content** in Session 9 required Participants to compare counters, to determine quantity, to do simple addition sums, determine more or less. New vocabulary, such as *plus, more, put together, equal, estimate* was learned. Participant 6 enjoyed working with numbers and his systematic working ways improved further. (*cf.* Graph 5.16; Appendix 5).

Session 10's **Content** included tasks demands, such as comparing counters, breaking down numbers, determining quantity, doing simple subtraction sums, determining more or less, giving explanations and offering solutions. New vocabulary such as *minus, subtraction, less, take away, equal, estimate* was learned. Although Participant 6 performed well when working with numbers, his skills improved further due to the task demands in Session 10 (*cf.* Graph 5.16; Appendix 5).

In Session 11 participants had to identify sounds already learned in their classroom setting. Participant 6 could not identify all the sounds and experienced difficulty in identifying beginning, middle and end sounds of three-letter words. At first he could not tell what a rhyme word was, but with mediation he quickly understood the concept. The task demands in Session 11 assisted in Participant 6's improved language skills, letter recognition, building up three-letter words, breaking down three-letter words, auditory discrimination, identifying beginning, middle, end sounds, comparing relationships between three-letter words and sounds, identifying rhyme words, giving explanations and offering solutions (*cf.* Graph 5.16; Appendix 5).

The **Content** in Session 12 facilitated Participant 6's direction, visual memory, categorisation, vocabulary, explanation and problem-solving capacity. The task demands in Session 12 helped him to distinguish between similarities and differences, to compare, match, explain, and offer solutions. He applied the strategies to successfully remember visual objects by means of categorisation. The task demands also addressed and developed his spatial orientation (*cf.* Graph 5.16; Appendix 5).

## 😊 Modalities: Sessions 1-12:

The **modalities** utilised in Sessions 1, 2, 3, 5, 6, 7, 11 and 12 were figural, pictorial, verbal and symbolic. The modalities utilised in Sessions 4, 8, 9 and 10 included numerical modality. Although Participant 6 could execute instructions, which means that he understood the verbal instructions given to him, he preferred pictorial, figural and symbolic modalities.

## 😊 Phases

Since the **Input Phase** demanded accurate gathering of information, need for precision and accuracy, considering two or more sources of information, clear perception, receptive verbal tools and spatial and time orientation, activities presented during Sessions 1 – 12 addressed all of the above and enabled Participant 6 to develop throughout the **CEPP** from fragile to emergent in the Input Phase (*cf.* Graph 5.16; Appendix 5).

During the **Elaboration Phase**, participants' planning behaviour, selection of relevant cues to solve a problem, summative behaviour, pursuing logical evidence, hypothetical thinking and strategies, internalisation, memory, categorisation, comparison, problem-solving and relationships were observed. All the activities in the **CEPP** from Sessions 1 to 12 attended to the above. These task demands contributed to the fact that Participant 6 developed from fragile to emergent in the Elaboration Phase (*cf.* Graph 5.16; Appendix 5).

Behaviour observed in the **Output Phase** were egocentric communication, blocking behaviour, visual transport, projection of virtual relations, transfer of rules, clear & precise language, impulsive behaviour and precision & accuracy. The task demands in Sessions 1 to 12 of the **CEPP** all focused on the above, which contributed to Participant 6's optimised ability in the Output Phase from fragile to adequate (*cf.* Graph 5.16; Appendix 5).

## 😊 Cognitive operations

Focus was placed on the following **Cognitive operations** in Sessions 1-12 of the **CEPP**. Categorisation, comparison, classification, planned systematic behaviour,

problem-solving, hypothetical thinking, mental representation, seriation and critical reflection. Since some of the cognitive operations (categorisation, comparison, classification, planned systematic behaviour, problem-solving and hypothetical thinking) were repeated in Session 2, Participant 6 had the opportunity to revise them and apply them together with the new cognitive operations, such as seriation and critical reflection (cf. Appendix 2: Session 1; Graph 5.16).

### 😊 **Complexity, Abstraction and Efficiency**

**Complexity, Abstraction and Efficiency levels** were low in Sessions 1-3, low to medium in Sessions 4-6, medium in Sessions 7-9 and medium to high in Sessions 10-12 (cf. Appendix 5).

Cognitive functions that **developed well** during the **CEPP** according to the different principles of mediation are the following (cf. 3.6):

Ψ **Mediation of individuation:** Participant 6 successfully worked independently (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of regulation and control of behaviour:** Participant 6 worked in a self-reflective, controlled and planned manner (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of goal-seeking, goal-setting and goal-achieving behaviour:** Participant 6 became a motivated learner who wanted to achieve success (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of transcendence:** Participant 6 successfully applied strategies and rules in new learning experiences (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of challenge:** Participant 6 could meet challenges set by task demands (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of an awareness of the human being as a changing entity:** Participant 6 became aware of his own progress and reflected on his work (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of the search for an optimistic alternative:** Participant 6 became focused and realised that problems could be solved in various ways. He also began to look for alternative solutions when presented with a problem (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ξ **Mediation of meaning:** Participant 6 understood instructions and could pose questions to Participant 7. He possessed the verbal tools to understand the meaning of concepts (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of a feeling of belonging:** Participant 6 bonded with Participant 7 and experienced a feeling of belonging (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

It is important, however, that these functions should be infused on a continuous basis in all future learning activities in order to be retained (*cf.* 5.4.1.1) (Feuerstein *et al.*, 2002:526).

I maintain that cognitive functions that still **need practice** and **attention** will improve if the following principles of mediation are optimised frequently:

- ☒ **Mediation of sharing behaviour:** Although Participant 6 improved in sharing his thoughts and actions with others and learned to give them a chance to explain their thoughts and actions, he should be encouraged to continue to share his thoughts spontaneously with others (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- ☒ **Intentionality and reciprocity:** Although Participant 6 developed into a self-reflective learner, this behaviour should be encouraged continuously (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:10; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Attending to the above could eliminate the problematic cognitive functions.

Participant 6 completed the first pre-test in **40** minutes and scored **14**. He completed the first post-test in **15** minutes and scored **10**, while the second pre-test was completed in **18** minutes and he scored **9**. After the **CEPP** he scored **21** in the second pre-test and completed it in **22** minutes. This result clearly show that Participant 6 benefited from the **CEPP** intervention programme. The delayed post-test took him **25** minutes to complete and he scored **27**. This score proves that retention took place and that Participant 6 benefited from the **CEPP** (*cf.* Graph 5.17). which means that to an extent the **CEPP** contributed to Participant 6's improvement in efficiency, his rapid response, and the precision and energy that he put into the tasks (*cf.* 5.4.1.1) (Feuerstein *et al.*, 2002:134-136).

An improvement in the nature and quality of cognitive change (*cf.* 5.4.1.2; Figure 6.4) in Participant 6 was evident (*cf.* 5.4.1.1) and he showed progress in planned working ways and applying strategies and rules learned (*cf.* 5.4.1.2; Figure 6.4).

It appears that Participant 6 reacts positively to mediation and possesses the ability to flourish in a mediational classroom setting in which cognitive thinking is being developed.

## 2.7 PROFILE: PARTICIPANT 7



### Input Phase

During the pre-test and the first ten sessions of the **CEPP** (*cf.* Graph 5.19; Figure 5.10; Appendix 2: Sessions 1-10) Participant 7 possessed no systematic thinking or behaviour and lacked precise and accurate working ways (Graph 5.19; Figure 5.10; Appendix 2: Session 1-10). He had no working strategies, and displayed vague and sweeping perceptions. He hurried through activities and therefore did not work accurately. He could not identify which group of Smarties contained the most sweets and which the least (*cf.* Appendix 2: Session 4). This correlates with what Benjamin (2009), Feuerstein *et al.* (2007:23, 24) and Tzuriel (2001:50-55, 72-73) affirm regarding deficient cognitive functions that may contribute to unplanned, unsystematic and impulsive exploratory behaviour (*cf.* 2.4). He counted randomly, but after mediation he counted more orderly.

Participant 7 demonstrated impulsive as well as guessing behaviour when he had to build the 3D shape construction and count the correct number of shapes. He could not associate the shape with the figure and struggled to arrange the blocks from small to big (*cf.* Appendix 5). He also experienced difficulties in categorising the shapes in groups. He could only arrange the shapes according to colour and not according to shape and size (*cf.* Appendix 5). He showed no negation strategies when looking for pieces of the shape puzzle and could not make relations and association and demonstrated no negation strategies when looking for pieces of the shape puzzle (*cf.* Graph 5.19; Figure 5.10; Appendix 2: Sessions 7, 8 & 9). Participant 7 also revealed extremely disruptive behaviour that impacted adversely on Participant 6 (*cf.* Graph 5.19; Figure 5.10; Appendix 2: Sessions 8 & 9). This correlates with what Lerner and Johns (2009:188) maintain, namely that there is a relationship between academic underachievement and externalising behaviour where students may act out to avoid aversive academic tasks. They may exhibit a wide range of poor social traits, such as impulsiveness, low tolerance for frustration and problems in handling day to day social interactions and situations (*cf.* 2.8.1).

During Sessions 11 and 12 where he was alone in the group due to his disruptive and disturbing behaviour, he displayed focused and attentive behaviour. No disruptive behaviour was present and he listened to instructions carefully and completed his work successfully (*cf.* Graph 5.19; Figure 5.10; Appendix 5; 12). He successfully completed the direction activity and could categorise the animals. He could not label the *tiger* and the *ladybird* (*cf.* Graph 5.19; 5.21).

During the pre-test Participant 7 showed impulsive behaviour and lacked the verbal tools to communicate and process information (*cf.* Figure 5.10; Appendix 7). After the **CEPP** was conducted with him, he performed much better in the last post-test where he systematically put out and labelled the picture cards, explained his answers and did finger tracking in the transfer work sheets (*cf.* Figure 5.10; Appendix 7).

He experienced difficulty in predicting possible answers, and could not distinguish between big and small shapes (*cf.* Graph 5.19; Figure 5.10; Appendix 7). He experienced difficulty in visualising the answers and put out the shapes randomly. This shows a relationship with what Benjamin (2009), Feuerstein *et al.* (2007:23) and Tzuriel (2001:50-51) maintain about learners who experience deficient cognitive functions in the **Input** Phase who will demonstrate extensive and vague perception (*cf.* 2.4.1).

Participant 7 understood the concept of patterning and could name the colours correctly. He could identify the shapes and could also distinguish between the size of the shapes (*cf.* Photo 5.4.22; Appendix 5).

**Photo 22:      Shape sizes**



Participant 7 could name objects that corresponded with certain shapes. He identified a circle as the head of a person and the square as the body of the person (*cf.* Graph 5.19; Appendix 5). He could explain that the shape pieces with curved lines fit in the circle (*cf.* Graph 5.19; Appendix 5). He remembered to do visual scanning and finger tracking when doing the transfer sheet (*cf.* Graph 5.19; Appendix 5). Although he counted the number of shapes he would need to build the construction, he did not count correctly and therefore put out less shapes than required (*cf.* Graph 5.19; Appendix 5; Appendix 7). To accurately observe is a cognitive skill at assessing reasonableness of ideas by assessing basic information (*cf.* Table 2.1 & Figure 2.3). It appears that Participant 7 still had difficulty with accurate observation.

Throughout Sessions 1-10 he did not show a need to complete tasks correctly (*cf.* Graph 5.19; Appendix 2: Sessions 1-10). His behaviour during Session 10 was extremely difficult.

Although he had a good number concept and could do the one-on-one correspondence activity, he did not understand the principles of *more or less* (*cf.* Graph 5.19; Appendix 5). After mediation he could estimate which group had the most or the least counters. With mediation he could explain addition, but tended not to listen to instructions (*cf.* Graph 5.19; Appendix 5) and therefore made unnecessary mistakes.

Initially his verbal tools were not well-established. He could not execute instructions because he did not listen to them. He could not identify “*sunflower*” and “*coal*”. He labelled the sunflower as “*sun*” and the heap of coal as a “*trolley*” (*cf.* Graph 5.19; Appendix 2: Session 1). He did not experience too much difficulty in recognising sounds and pictures (*cf.* Graph 5.19; Figure 5.11; Appendix 5). He could name objects that start with a specific letter, e.g. “*tent, tier, tien*”. He could identify the sounds, as well as the beginning and end sounds of a three-letter word (*cf.* Graph 5.19; Figure 5.11; Appendix 5). He struggled however to identify the middle sound of a three-letter word, but after mediation it became easier for him to recognise the middle sound, e.g. “*b-u-s*”. At first he did not know what a rhyme word was, but after a few examples he could identify rhyme words, such as *mat* and *rat* (*cf.* Graph 5.19; Appendix 5). His behaviour during the whole session was perfect.

During Sessions 11 and 12 as well as the last post-test and delayed post-test (*cf.* Graph 5.19; Appendix 5), Participant 7 learned to look at all the possibilities carefully. He worked more cautiously and considered options and possible answers before making a final decision. His planning became more systematic and he began to reflect on his answers and correct himself. He became more aware of his working ways.

During the pre-test and the first four sessions of the intervention programme he was able to only consider two sources of information at the same time (*cf.* Graph 5.19, 5.22 ; Appendix 2: Sessions 1-4). This skill developed throughout the intervention programme. During the last post-test and delayed post-test he could easily compare objects simultaneously and was able to notice differences and similarities in shapes, letters, numbers and pictures (*cf.* 2.3). This statement shows relation with literature (Eggen & Kauchak, 2010:40; Papalia *et al.*, 2008:269,270; Van Staden, 2005:53.54) where it is indicated that pre-school learners should possess classification and categorisation skills (*cf.* 2.3).

Although his inferential thinking was emerging because he sometimes still randomly gave answers without thinking them through, he realised he should work accurately (*cf.* Graph 5.19; Appendix 5).

I carefully assume that Participant 7 developed from **Deficient (0)** cognitive functions where he passively accepted the demand of the mediator for repetition, to **Adequate (6)** cognitive functions in the Input Phase where he applied previously used and semi-internalised strategies (*cf.* Table 5.1) (Benjamin, 2009).

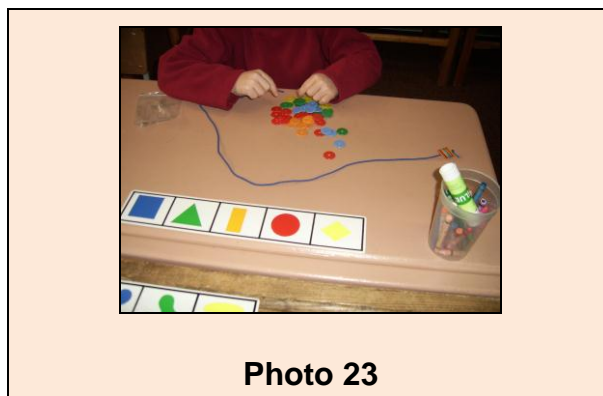


### Elaboration Phase

At first Participant 7 did not have a cue when solving problems (*cf.* Graph 5.19; Figure 5.10; Appendix 3.2). He could not work out the problem for himself and did not work according to rules. No summative, systematic, and planned behaviour was present, because he did not estimate how much and which shapes he would need to complete his 3D construction (*cf.* Graph 5.19; Appendix 2: Sessions 5, 6; Appendix 3.2). He demonstrated no exploratory approach and struggled with classification of objects.

During Session 1 he struggled to put buttons in groups due to attention fluctuation and he could not string them according to the example because he did not listen to the instructions (*cf.* Graph 5.19; Appendix 2: Session 1).

**Photo 23: Stringing the buttons**



**Photo 23**

After mediation, he began to work more logically and started to select relevant information in order to solve a problem, but tended to return to his unsystematic working ways. From Session 8 onwards he could compare options before deciding on a final answer (*cf.* Graph 5.19; 3.6.2.5; Appendix 5).

Participant 7 also struggled with the position of the pegs on the pegboards (*cf.* Graph 5.19; Appendix 2: Session 3), but he remembered to work from left to right. He demonstrated impulsive and trial and error behaviour, did not explain his solutions and worked extremely unsystematically where he had to plan how many shapes he would need to build his 3D construction (*cf.* Graph 5.19; Appendix 5). He did not consider possibilities – he simply took a piece of shape and tried to fit it in the correct place. With mediation he started to look at other possibilities (*cf.* Graph 5.19; Appendix 5).

Initially his memory performance (*cf.* Figure 5.11) was fragile. He could not communicate his thoughts and demonstrated poor memory. He could remember **2** of the **24** pictures. After mediation 1 he could remember **15** of the **24** pictures and after mediation 2 he could remember **18** of the **24** pictures. During session 12 (*cf.* Figure 5.11; Appendix 5) where he had to categorise animals and try to remember the animals he saw during the activity he could remember **7** of the **24** pictures. After mediation he

could remember **17** of the pictures (*cf.* Figure 5.11; Appendix 5). He showed progression in hypothetical thinking and internalising his thoughts (*cf.* Appendix 7)

Participant 7 found it difficult to think abstractly about the steps he should take to complete an activity (*cf.* Figure 5.3; Appendix 2: Sessions 1-4). He first did it concretely; saw his mistake before he corrected it. He showed trial and error behaviour. After a few intervention sessions, he could identify his mistake and correct it (*cf.* Figure 5.3; Appendix 2: Sessions 6-12). This behaviour was also evident in the last post-test.

At first he could not explain his answers and could not communicate his thoughts. He had no step by step working procedure, could not find a strategy to solve problems and could not predict an outcome (*cf.* Graph 5.19; Appendix 2: Sessions 1-8), but after a few intervention sessions he was confident in his answers, was able to explain them logically, started to work more systematically and searched for strategies (*cf.* Graph 5.19; Appendix 2: Sessions 11-12). He was able to see the difference between shapes, and could verbalise the difference between a rectangle, square, triangle and circle (*cf.* Graph 5.19; Appendix 2: Sessions 5, 6).

He enjoyed working with numbers and understood the concept of addition and subtraction. He could do the classification with number, dot and picture. At first he completed activities randomly, later on he displayed the need to rethink his final answer – this had not been present in Sessions 1-9 (*cf.* Graph 5.19; Appendix 2: Sessions 10-12).

Participant 7 did not display hypothetical thinking in the first five sessions of the **CEPP** (*cf.* Graph 5.19; Appendix 5), because of his impulsive and random answers without thinking them through. He could however identify shapes hidden in a bag, and was able to explain the characteristics of the shapes. From Session 11 onwards he could work out a strategy to find the answers (*cf.* Graph 5.19; Appendix 5). When I reminded him, he approached tasks more systematically. He was able to identify the function of an object with the size of the shapes, e.g. small circles to make the wheels and the big circle to make the head of the man – the same with the rectangles (*cf.* Graph 5.19; Appendix 5). During the last post-test and the delayed post-test, he could explain his answers.

It appears that Participant 7 developed from **Deficient (0)** cognitive functions where he passively accepted the demand of the mediator for repetition, to **Adequate(6)** cognitive functions in the Elaboration Phase where he applied previously used and semi-internalised strategies (cf. Table 5.1) (Benjamin, 2009).



## Output Phase

Participant 7 showed egocentric behaviour throughout Sessions 1-10 by making strange noises, pulling faces and exhibiting overall disruptive behaviour (cf. Graph 5.19). Although he could work from outside his working space, he worked extremely unsystematically. I had to bring him back several times to focus on the task at hand (cf. Graph 5.19; Appendix 2: Sessions 1-10). Because of mediation he could identify a starting point from Session 7 onwards, even though he sometimes still showed impulsive behaviour (cf. Graph 5.19 ; Appendix 5). This compares well with what literature says regarding MLE that can turn a cognitive deficient learner into an independent and self-regulating learner (cf. 2.7.2.5) (Anon., 2008b; Fraser, 2006:9; Feuerstein, 1980:22).

Participant 7 could complete the missing parts of the pattern, which means that he could visually transfer the picture (cf. Photo 5.4.24; Graph 5.19; Appendix 2: Session 4, 5).

### Photo 24: Missing parts in a pattern



Photo 24

During Session 7 he experienced difficulty with visual transport, because he now had more information to consider (cf. Graph 5.19; Appendix 5).

Initially he did not learn according to rules and therefore gave many trial and error responses. He struggled to think abstractly and still needed to figure things out concretely (*cf.* Graph 5.19; Appendix 2: Session 1-7). From Session 10 (*cf.* Graph 5.19) onwards he started to apply rules and strategies of what he had learned.

At first, during the pre-test and the first 9 sessions of the **CEPP** (*cf.* Graph 5.19; Appendix 2: Sessions 1-9), he could not plan his choices; he made the choice first and then realised it was wrong (*cf.* Appendix 7). Later on he could apply the rules and strategies. He understood the rule, worked more systematically and applied the transfer principles (*cf.* 2.3; Graph 5.19; Appendix 2: Sessions 10-12). He was eager to complete the activities and sometimes still made mistakes, because he did not think about his answer. This is in line with what literature maintains regarding meta-cognition which is still emerging in the young learner between the ages of four and six (*cf.* 2.2.2) (Robson, 2006:84; Botha *et al.*, 1990:276).

Participant 7 enjoyed working with numbers and could give examples of where one can use addition and subtraction, e.g. losing something (*cf.* Graph 5.19; Appendix 5). He could create his own pattern of shapes and worked easily from outside the working space to the working space (*cf.* Graph 5.19; Appendix 5).

No deficiency of visual transport was present. He could visualise change of directions, relations and connections internally when completing the activity where he had to match vehicles from various directions (*cf.* Graph 5.19 ; Appendix 5). He could make mental representations. Although he understood the principle of virtual relations, he sometimes still projected it incorrectly (*cf.* Graph 5.19; Appendix 2: Session 2) but showed signs of progression from Session 7 onwards.

Participant 7 never showed any sign of blocking behaviour and showed no resistance to mediation. It seems that he developed from **Deficient (0)** cognitive functions where he passively accepted the demand of the mediator for repetition, to **Adequate (6)** cognitive functions in the Output Phase where he applied previously used and semi-internalised strategies (*cf.* Table 5.1) (Benjamin, 2009).



## Non-intellective factors

Although Participant 7 was open to mediation, he was not persistent to complete tasks successfully. His locus of control was not good, due to his bad behaviour (*cf.* Graph 5.19; Appendix 2: Sessions 1-10). He never thought his answers through. However, he never rejected my attempts to teach and assist him. He did not show signs of previous negative experiences with a mediator or learning, because he never withdrew passively from learning. No fear of failure or anxious behaviour was present. From Sessions 11 and 12 onwards he showed more control over the execution of tasks and wanted to work out problems (*cf.* Chapter 2.2.2; Graph 5.19; Appendix 2: Sessions 11, 12). He was confident in his answers during the last post-test and delayed post-test, showed no fear of failure and expressed a high level of energy, vividness, attentiveness and interest.

Participant 7 showed a **low to medium** level of modifiability, since he required several explanations; needed prompts to recall learning from an earlier learning experience as well as to implement strategies independently (*cf.* Graph 5.1; 5.2; 5.4.1.3; Table 6.1). He progressed from **Deficient (0)** to **Adequate (6)** regarding Non-intellective factors



## Reflection

As a consequence of the task demands (activities) in the **CEPP** (*cf.* Appendix 5), deficient cognitive areas in Participant 7 could be addressed, adjusted and modified. Due to his **unsystematic, impulsive and inaccurate** working behaviour (*cf.* Appendix 5) he made numerous and unnecessary mistakes that affected his performance during the study, but which will also impact negatively on future performance in a formal teaching setting, such as Grade 1, if not rectified (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

Participant 7 also tended to “forget” **rules and strategies** and struggled to **solve problems** due to his impulsive behaviour during Sessions 1-6 (*cf.* Appendix 2: Sessions 1-6). He also did not **verify** his work (*cf.* Appendix 5) which contributed to unnecessary mistakes. He also experienced difficulties in **predicting** answers and solutions and did not display **hypothetical thinking** (*cf.* Appendix 2: Sessions 1-6). He could not focus on an activity and had difficulty in remembering objects he had seen (*cf.* Appendix 2: Sessions 1-6). Although his verbal tools were good, he struggled with identifying sounds (*cf.* Appendix 5) which may be an indication that his **auditory discrimination** was not sufficiently developed. All these factors disadvantaged him from performing well in the pre-test (*cf.* Appendix 3.2) and may prevent him from reaching his potential in his school career, if not resolved in time (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

Participant 7 exhibited 15 of the 18 criteria for Subtypes of ADHD in a reference manual entitled the *Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition*, published by the *American Psychiatric Association* (Lerner & Johns, 2009:222). The characteristics that Participant 7 revealed throughout the whole research were, among others:

- ☹ fails to give attention to details and makes careless mistakes;
- ☹ has difficulty sustaining attention;
- ☹ does not seem to listen;
- ☹ does not follow through or finish tasks;
- ☹ has difficulty organising tasks and activities;
- ☹ is easily distracted by extraneous stimuli;
- ☹ fidgets with hands or feet;
- ☹ squirms in seat;
- ☹ leaves seat in classroom or in other situations;

- ☹️ runs and climbs excessively;
- ☹️ talks excessively;
- ☹️ acts as if driven by motor and cannot sit still;
- ☹️ blurts out answers before questions are completed;
- ☹️ has difficulty waiting in line or awaiting turn in games or activities; and
- ☹️ interrupts or intrudes on others.

During Sessions 11 and 12 when he worked alone, his behaviour improved extensively. He was more focused and motivated to successfully complete tasks and completed activities in a shorter period than in the other sessions, because his attention was focused on the task at hand and he was not distracted by others (*cf.* Appendix 5-12; Appendix 3,4; Appendix 7). Participant 7 would easily reach his full potential if he was to be accommodated in a smaller class due to his attention disorder.

### 😊 **Task demands**

The task demands in the **CEPP** (*cf.* 6.4.2) assisted in rectifying Participant 7's cognitive deficiencies and replaced his impulsive and unorganised behaviour with self-regulation by means of planned comparative behaviour, verbal tools and hypothesis-testing techniques.

### 😊 **Content**

The **Content** in Session 1 of the **CEPP** required participants to recognise basic colours, such as blue, green, red, yellow, white, black and orange. Participants had to compare and classify the colours, learn new vocabulary, give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** assisted Participant 7's classification abilities, expanded his vocabulary (he had to name objects of specific colours) and helped him to explain his decisions and to come up with solutions (*cf.* Graph 5.19; Appendix 2: Session 1).

The **Content** in Session 2 of the **CEPP** required participants to recognise basic colours, seriate and create patterns with their coloured disks. Participants had to recognise the colours, learn new vocabulary (e.g. *pattern*), give explanations regarding their actions

and offer solutions. These task demands contained in the **CEPP** assisted Participant 7's seriation skills, expanded his vocabulary and helped him to explain his decisions and come up with solutions (*cf.* Graph 5.19; Appendix 2, **CEPP**: Session 2).

The **Content** in Session 3 of the **CEPP** required participants to recognise basic colours, and determine the position of objects to other objects. Participants had to learn new vocabulary (e.g. *above, behind, next to*, etc), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** assisted Participant 7's spatial orientation, expanded his vocabulary and helped him to explain his decisions and come up with solutions (*cf.* Graph 5.19; Appendix 2: Session 3).

In Session 4 the **Content** once again entailed colour recognition, comparison, classification, vocabulary (*more or less*, etc.), explanations and solutions. In this session new content, namely number quantity was addressed. Participants had to count the Smarties they received, categorise them in groups (according to colour), and determine which group contained the most sweets and which the least. Participants then had to put the Smarties on a graph (*cf.* Appendix 2: Session 4). Participant 7 performed very well in this session and he was eager to explain his decisions and give solutions (*cf.* Graph 5.1; Appendix 2: Session 4).

The **Content** in Session 5 involved colour recognition, vocabulary (triangle, rectangle, circle, square, and diamond), explanations and solutions. New content with regard to shape recognition, direction (left, right, next to, above, behind) and sequence were dealt with. Participants physically explored the characteristics of the various shapes (curved line, four equal sides, etc). Participant 7 performed well in these sessions, since he could concretely manoeuvre the shapes (*cf.* Graph 5.19; Appendix 5).

In Session 6 the **Content** entailed shape recognition, relationships between shapes, comparing shapes, vocabulary, such as *big, small, medium, big, bigger, biggest*, etc. Participants had to arrange the wooden shapes according to size and explained what they did and why they arranged the wooden shapes the way they did. They also had to build 3D constructions where they had to plan which shapes, how many shapes and what size shapes they would need. During Session 6 Participant 7 also had to give

explanations and offer solutions. The task demands of Session 6 aided him in becoming a more reflective and critical thinker (*cf.* Graph 5.19; Appendix 5).

The **Content** in Session 7 involved recall regarding colour, shape, relationships and characteristics of shapes. Participants had to assemble shape pieces to create a specific shape. In doing this Participant 7 learned to compare, use vocabulary, explain his actions and come to solutions (*cf.* Graph 5.19; Appendix 5).

The **Content** in Session 8 required Participants to discuss picture cards, categorise counters (according to colour), determine the amount of counters, count them and match them to a counter, dot card, picture, and number name. While counting, the one-to-one-correspondence concept was also instilled. Participant 7 was given the opportunity to explain how many more or less counters he had and what he could do to make the counters equal. Participants also had the opportunity to pose simple problems regarding *more or less*. The task demands in Session 8 enabled Participant 7 to count, compare, estimate, explain, offer solutions and learn new vocabulary (*cf.* Graph 5.19; Appendix 5).

The **Content** in Session 9 required participants to compare counters, determine quantity, do simple addition sums, determine *more or less*. New vocabulary, such as *plus, more, put together, equal, estimate*, was learned. Participant 7 enjoyed working with numbers and although he sometimes tended to make unnecessary mistakes due to over-eagerness, he learned to work in a more planned and systematic way (*cf.* Graph 5.19; Appendix 5).

Session 10's **Content** included tasks demands such as comparing counters, breaking down numbers, determining quantity doing simple subtraction sums, determining more or less, giving explanations and offering solutions. New vocabulary, such as *minus, subtraction, less, take away, equal, estimate*, was learned. Although Participant 7 performed well when working with numbers, his skills improved due to the task demands in Session 10 (*cf.* Graph 5.19; Appendix 5).

In Session 11 participants had to identify sounds already learned in their classroom setting. Participant 7 did not perform well in this Session. He struggled to identify the sounds, rhyme words, beginning, middle and end sounds of three-letter words. The

task demands in Session 11 contributed to Participant 7's improved language skills, letter recognition, building up three-letter words, breaking down three-letter words, auditory discrimination, identifying beginning, middle and end sounds, comparing relationships between three-letter words and sounds, identifying rhyme words, giving explanations and offering solutions (*cf.* Graph 5.19; Appendix 5).

The **Content** in Session 12 facilitated participants' direction, visual memory, categorisation, vocabulary, explanation and problem-solving capacity. The task demands in Session 12 assisted Participant 7 to distinguish between similarities and differences, to compare, match, explain, and offer solutions. The task demands also addressed and developed his spatial orientation (*cf.* Graph 5.19; Appendix 5).

### 😊 **Modalities: Sessions 1-12:**

**The modalities** utilised in Sessions 1, 2, 3, 5, 6, 7, 11 and 12 were figural, pictorial, verbal and symbolic. The modalities utilised in Sessions 4, 8, 9 and 10 included numerical modality. Although Participant 7 could execute instructions, which means that he understood the verbal instructions given to him, he preferred figural and numerical modalities.

### 😊 **Phases**

Since the **Input Phase** demanded accurate gathering of information, need for precision and accuracy, considering two or more sources of information, clear perception, receptive verbal tools and spatial and time orientation, activities presented during Sessions 1 – 12 addressed all of the above and enabled Participant 7 to develop throughout the **CEPP** from deficient to emergent in the Input Phase (*cf.* Graph 5.19; Appendix 5).

During the **Elaboration Phase**, participants' planning behaviour, selection of relevant cues to solve a problem, summative behaviour, pursuing logical evidence, hypothetical thinking and strategies, internalisation, memory, categorisation, comparison, problem-solving and relationships were observed. All the activities in the **CEPP** from Sessions 1 to 12 attended to the above. These task demands contributed to the fact that Participant 7 developed from deficient to emergent in the Elaboration Phase.

Behaviour observed in the **Output Phase** comprised egocentric communication, blocking behaviour, visual transport, projection of virtual relations, transfer of rules, clear and precise language, impulsive behaviour, and precision and accuracy. The task demands in Sessions 1 to 12 of the **CEPP** all focused on the above, which contributed to Participant 7's optimised ability in the Output Phase from deficient to emergent.

### 😊 **Cognitive operations**

Focus was placed on the following **Cognitive operations** in Sessions 1-12 of the **CEPP**: Categorisation, comparison, classification, planned systematic behaviour, problem-solving, hypothetical thinking, mental representation, seriation and critical reflection. Since some of the cognitive operations (categorisation, comparison, classification, planned systematic behaviour, problem-solving, and hypothetical thinking) were repeated in Session 2, Participant 7 had the opportunity to revise them and apply them together with the new cognitive operations, such as seriation and critical reflection (*cf.* Appendix 2: Session 1; Graph 5.19).

### 😊 **Complexity, Abstraction and Efficiency**

**Complexity, Abstraction and Efficiency levels** were low in Sessions 1-3, low to medium in Sessions 4-6, medium in Sessions 7-9 and medium to high in Sessions 10-12 (*cf.* Appendix 5). Cognitive functions that **developed well** during the **CEPP** according to the different principles of mediation are the following (*cf.* 3.6):

Ψ **Intentionality and reciprocity**: Participant 7 developed an interest in learning and reflected on and corrected his work (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:10; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of transcendence**: Participant 7 could progressively apply strategies and rules in new learning experiences (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of meaning**: Participant 7 constantly asked questions in search of meaning (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et*

*al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of competence:** Participant 7 became motivated to successfully complete activities and regularly reflected on his work (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of sharing behaviour:** During the CEPP Participant 7 learned to explain his thoughts and actions to others and learned to give them a chance to explain their thoughts and actions (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of individuation:** Participant 7 developed into an independent and creative learner (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of challenge:** Participant 7 became more and more excited to engage in tasks and was not afraid of activities that were not familiar to him and regarded them as a challenge (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of an awareness of the human being as a changing entity:** From Session 6 onwards Participant 7 became more aware of his own progress and began to reflect on his work (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of the search for an optimistic alternative:** Participant 7 realised that problems could be solved in various ways and therefore started to look for alternative solutions when presented with a problem (Anon., 2008a; Feuerstein *et*

*al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of a feeling of belonging:** Participant 7 and his fellow- participant shared their experiences and he began to realise that other people also have ideas and needs and that he should respect that. This experience assisted him to identify and bond with others (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

It is important however that these functions should be infused on a continuous basis in all future learning activities in order to be retained (*cf.* 6.3) (Feuerstein *et al.*, 2002:526).

Cognitive functions still **need practice** and **attention**, and I maintain that these aspects will improve if the following principles of mediation are optimised frequently:

Ξ **Mediation of regulation and control of behaviour:** Although Participant 7's impulsive behaviour improved throughout the **CEPP**, he should still be reminded to exercise self-reflection and controlled and planned behaviour (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ξ **Mediation of goal-seeking, goal-setting and goal-achieving behaviour:** Since Participant 7 did not behave in a goal-directed way, this skill should be developed and promoted (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Attending to the above could eliminate the problematic cognitive functions.

Participant 7 completed the first pre-test in **45** minutes and scored **19**. The first post-test was completed in **38** minutes and he scored **26**. The second pre-test took him **25** minutes and he scored **13** points. After the **CEPP** it took him only **20** minutes to complete the second post-test and he scored **26** points. The delayed post-test took him

**26** minutes and he scored **30**. This score is a clear indication that retention took place and that Participant 7 benefited from the **CEPP** (*cf.* Figure 5.10). The results indicate that his performance improved quite well. Because some of the functions, as indicated above, are not yet involuntary, more exposure is necessary as planning behaviour and alertness should be instilled. This means that the **CEPP** contributed to Participant 7's improvement in efficiency, his rapid response, and the precision and energy that he put into the tasks (*cf.* 6.3) (Feuerstein *et al.*, 2002:134-136).

An improvement in the nature and quality of cognitive change (*cf.* 6.3; Figure 6.4) in Participant 7 was evident (*cf.* 6.3) and he showed progress in planned working ways, applying strategies and rules learned (*cf.* 6.3; Figure 6.4).

It appears that Participant 7 reacted positively to mediation and possesses the ability to flourish in a mediational classroom setting in which cognitive thinking is being developed. It also appears that retention took place and it looks as if Participant 7 benefited from the **CEPP** (*cf.* Figure 5.7) owing to his awareness of his own actions and improvement.

## 2.8 PROFILE: PARTICIPANT 8



Figure 5.12 and Figure 5.13 clearly indicate that Participant 8 possessed no planned, reflective, systematic, exploratory approach, tracking, scanning and systematic exploration during the pre-test, as well as during Sessions 1 to 7 (*cf.* Figure 5.12; Appendix 2: Sessions 1 -7; Appendix 7), and lacked precise and accurate working ways. She demonstrated impulsive behaviour and sometimes “jumped” at activities without thinking her strategies through. She did not approach her pattern activity systematically (*cf.* Photo 2.7; Appendix 2: Session 4). Although she made use of finger tracking and visual scanning, she did not communicate her thoughts and answers.

No need for precision, accuracy and completeness in data gathering was present due to her over-eagerness to complete activities which resulted in incorrect completion of activities. This links to the views of Epstein (2008:40), Lerner (2006:188) and Rivken, (2002:37) regarding impulsive learners who do not perform as well at school as reflective learners do (*cf.* 2.2.3.1). According to Benjamin (2009), Feuerstein *et al.* (2007:23, 24) and Tzuriel (2001: 50 – 55; 72-73), learners who experience problems with accuracy and a need for precision have deficient cognitive functioning in the **Input Phase**, which may continue in the Elaboration and Output Phases if not dealt with in time (*cf.* 2.4.1) After mediation, where I delayed her responses while providing her with opportunities for considering all aspects of the problem, she could work more systematically, especially during the last post-test and the delayed post-test (*cf.* Figure 5.12; Figure 5.13; Appendix 3.1; Appendix 3.2).

Participant 8 reacted positively to stimuli and mediation; therefore her planning became more systematic from Session 8 onwards. She looked at all possibilities carefully and started to consider more than one source of information. During the last post-test she showed good progression. She remembered the rules and showed potential to become a systematic worker. This correlates with what Benjamin (2009), Feuerstein *et al.* (2007:23, 24) and Tzuriel (2001:50-55, 72-73) state regarding deficient cognitive

functions that result in unplanned, unsystematic and impulsive exploratory behaviour, but which can be reversed with mediation (*cf.* 2.4; Table 2.1 & Table 2.2).

From Session 8 onwards (*cf.* Figure 5.12; Appendix 5) good progression regarding systematic working ways was evident. This draws a parallel with literature regarding establishing pre-required thinking behaviour due to mediation, that ensures self-regulation, application of rules, principles and strategies which diminish impulsivity in the learner (*cf.* 3.3) (Lerner & Johns, 2009:232; Lerner, 2006:188; Tzuriel, 2001:28).

Participant 8 did not experience difficulty in predicting possible answers, and could distinguish between big and small shapes (*cf.* Figure 5.12; Figure 5.13; Appendix 7). She however found it difficult to match shape pieces in Session 7, which was an indication that she struggled to analyse parts and whole relationships (*cf.* Appendix 2, **CEPP**: Session 7). This is also the reason why she experienced difficulties to identify the middle and end sounds of three-letter words, e.g. “**p-e-t**” (*cf.* Appendix 5). She found the direction activity difficult, which indicated that her spatial relation was not up to standard and needed more attention. According to Papalia *et al.* (2008:29) and Van Staden (2005:54), most five- to six-year old learners should be able to understand their own position in space compare to other objects or persons near them (*cf.* 2.10.3.1).

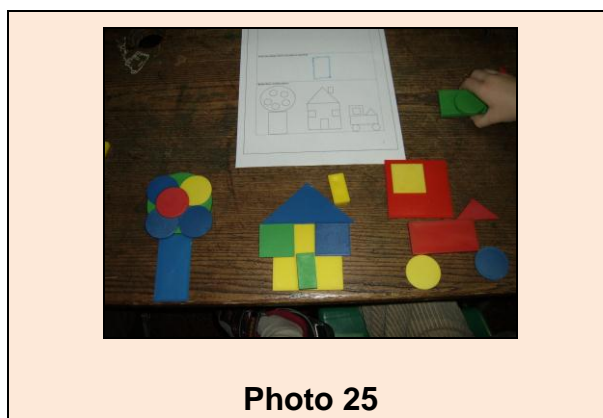
Participant 8 possessed good receptive verbal tools to process information and she labelled objects accurately and precisely, but she did not verbalise her thoughts and explain her answers. She did not experience difficulty in recognising pictures and sounds, especially the beginning sounds of words (*cf.* Figure 5.12; Appendix 5). She however struggled with identifying the middle and end sounds of three-letter words (*cf.* Figure 5.12; Appendix 5). She could name the shapes as well as their characteristics. During Session 12 she could name all the animals and categorise them correctly (*cf.* Appendix 5).

Although she could identify which group of Smarties contained the most sweets and which the least (*cf.* Figure 5.12; Figure 5.13 & Appendix 2: Session 4), she could not estimate the amount – she had to count the groups. During the pre-test and the first four sessions of the intervention programme she was able to only consider two sources of information at the same time (*cf.* Figure 5.12, Figure 5.13 ; Appendix 2: Sessions 1-

4). This skill developed throughout the intervention programme and during the last post-test and delayed post-test she could easily compare objects simultaneously and was able to notice differences and similarities in shapes, letters, numbers and pictures (*cf.* 2.3 & Photo 2.7). This statement shows correlation with literature (Eggen & Kauchak, 2010:40; Papalia *et al.*, 2008:269,270; Van Staden, 2005:53.54), namely that classification and categorisation skills of the pre-school learner should be intact (*cf.* 2.3).

Participant 8 enjoyed numbers and could count from 1 to 10 and backwards easily and add and subtract problems orally, concretely and abstractly, as well as estimate groups (*cf.* 2.3; Figure 5.12; Appendix 2: Sessions 8-10). Although she counted the amount of shapes she would need to build the 3 D-construction, she did not count correctly and therefore put out less shapes than required (*cf.* Photo 5.4.25; Figure 5.12; Appendix 5; Appendix 7). To accurately observe is a cognitive skill at assessing reasonableness of ideas by assessing basic information (*cf.* Table 2.1 & Figure 2.3). It is evident that this skill needs to be developed in Participant 8.

**Photo 25: Planning of shape construction**



During Sessions 11 and 12 as well as the last post-test and delayed post-test (*cf.* Figure 5.12; Appendix 5), she learned to look at all the possibilities carefully. She worked more cautiously and considered options and possible answers before making a final decision. Her planning became more systematic and she began to reflect on her answers and correct herself. She became more aware of her working methods, choices, actions and answers (*cf.* 2.2.2; Figure 5.12; Appendix 5-12).

Although her inferential thinking was emerging due to her impulsive behaviour, she sometimes realised the importance of working in a systematic, planned and accurate manner (*cf.* Figure 5.12; Appendix 5-12).

It appears that Participant 8 developed from **Deficient (0)** cognitive functions where she was encouraged to apply or transfer already learned rules to other areas of content, to **Independent (9)** cognitive functions in the Input Phase where she fully internalised mediation, demonstrated self-regulation behaviour and reacted positively to stimuli (Table 5.1) (Benjamin, 2009).



### Elaboration Phase

Initially Participant 8 could not identify a starting point when solving problems (*cf.* Figure 5.12; Appendix 5). She also did not select relevant cues and could not work according to rules. She did not work logically and did not consider problems well. No summative behaviour was present, because she did not estimate how many and which shapes she would need to complete her 3D construction (*cf.* Photo 5.4.25; Figure 5.12; Appendix 2: Sessions 5, 6). She did not approach her work logically. After mediation, she began to work more logically and started to select relevant information in order to solve a problem. From Session 8 onwards she could compare options before deciding on a final answer (*cf.* Figure 5.12; Figure 3.25; 3.6.2.5; Appendix 5).

During the pre-test she could not compare objects but only made associations with objects. She was able to recall where in the environment she could find certain shapes, e.g. triangle = tent, roof (*cf.* Figure 5.12; Figure 5.13; Appendix 2: Sessions 1-3; Appendix 3.1; Appendix 3.2).

Participant 8 found it difficult to think abstractly about the steps she should take to complete an activity (*cf.* Figure 5.12; Appendix 5) and demonstrated trial and error behaviour. She struggled to correct herself, especially with tasks regarding spatial orientation. After a few intervention sessions, she could identify her mistake and correct it (*cf.* Figure 5.12; Appendix 2: Sessions 7-12). This behaviour was also evident in the last post-test and delayed post-test (*cf.* Figure 5.13; Appendix 3.3.1; Appendix 3.3.2).

Initially she could not, did not want to explain her answers, and could not communicate her thoughts, although it was evident that she considered possibilities. The process of producing spoken language is called **oral expressive language**. Learners who experience difficulty in this area understand speech and language produced by others, but have difficulty in producing speech or in talking themselves. These learners will perform well on non-verbal tasks. Some of these learners will be able to speak single words or short phrases, but are unable to formulate complete sentences (*cf.* 2.7.2) (Lerner & Johns, 2009:265; Lerner, 2006:343).

Participant 8 had no step by step working procedure, could not find a strategy to solve problems and could not predict an outcome (*cf.* Figure 5.12; Appendix 2, **CEPP**: Session 1-7), but after a few intervention sessions she was confident in her answers, was able to explain them logically, started to work more systematically and searched for strategies (*cf.* Figure 5.12; Appendix 5 -12). She was able to see the difference between shapes, and could verbalise the difference between a rectangle, square, triangle and circle (*cf.* Figure 5.12; Appendix 2: Session 5, 6).

During Session 9 she showed that she understood numbers (*cf.* Figure 5.12; Appendix 5-10). Much more systematic and planned behaviour was present from Session 8 onwards. She enjoyed working with numbers and understood the concept of addition and subtraction. She could do the classification with number, dot and picture. Initially she randomly completed activities but later on she displayed the need to rethink her final answer – this had not been present in Sessions 1-7 (*cf.* Figure 5.12; Appendix 5). She could categorise the Smarties and showed logical behaviour when doing so (*cf.* Figure 5, 24; Appendix 2: Session 4). She also found it easy to group the shapes according to shape and colour but hypothetical thinking was not yet in place.

From Session 8 onwards her planning improved and she exhibited systematic working ways, e.g. worked from top to bottom, from left to right (*cf.* Appendix 2: Session 4). During Session 7 she could not successfully complete the activity cards and she struggled with the transfer worksheet (*cf.* Appendix 5).

During Session 5 (*cf.* Figure 5.12; Appendix 5) she could identify shapes hidden in a bag, and was able to explain the characteristics of the shapes. From Session 8 onwards

she could work out a strategy to find the answers (cf. Figure 5.12; Appendix 5). She could orally explain simple addition and subtraction problems. During the last post-test and the delayed post-test, she could explain her answers (cf. Figure 5.13; Appendix 3.3.1; Appendix 3.3.2).

Participant 8's visual memory performance (cf. Figure 5.14) was average. She could remember **17** of the **24** pictures (cf. Figure 5.14; Appendix 4). After mediation 1 she could remember **16** of the **24** pictures and after mediation 2 she could remember **18** of the **24** pictures. During session 12 (cf. Figure 5.12; Appendix 5) where she had to categorise animals and try to remember the animals she saw during the activity. She could remember only 2 of the 24 pictures. After mediation she could remember **20** of the **24** pictures (cf. Figure 5.14; Appendix 5). She showed progression in hypothetical thinking and internalising her thoughts (cf. Appendix 7).

She demonstrated excellent verbal tools and could easily make relations with pictures and sounds (cf. Figure 5.12; Appendix 5). She also found the reversed transfer worksheet easy to complete (cf. Photo 5.4.26).

**Photo 26: Reversed transfer worksheet**



It can be assumed that Participant 8 developed from **Deficient (0)** cognitive functions where she was encouraged to apply or transfer already learned rules to other areas of content, to **Adequate (6)** cognitive functions in the Elaboration Phase, where she could apply previously used and semi-internalised strategies and reflect on her work (cf. Table 5.1) (Benjamin, 2009).



## Output phase

Participant 8 showed egocentric behaviour throughout Sessions 1-6 (*cf.* Figure 5.12; Appendix 2: Sessions 1-6; Appendix 6.3). She exhibited trial and error behaviour when executing tasks, mostly because of her impulsiveness. This correlates with what literature maintains regarding impulsive learners who do not perform as well in school as those who are more reflective (Epstein, 2008:40; Lerner, 2006:188, Rivken, 2002:37).

She showed perseverance during Session 7 when she didn't give up the struggle to fit shape pieces (*cf.* Figure 5.24; Appendix 5). Because of mediation she could identify a starting point from Session 7 onwards, even though she sometimes still showed impulsive behaviour (*cf.* Figure 5.12). This compares with what literature says regarding MLE that can turn a cognitive deficient learner into an independent and self-regulating learner (*cf.* 2.7.2.5) (Anon., 2008b; Fraser, 2006:9; Feuerstein, 1980:22).

Participant 8 experienced problems with visual transport and could not go from the immediate to the unknown. She could not transfer and project relationships (*cf.* Figure 5.12; Appendix 2: Session 1-3). From Session 6 onwards she started to summarise the activities by scanning them visually and she also started to think more abstractly (*cf.* Figure 5.12; Appendix 5). From Session 9 (*cf.* Figure 5.12) onwards she started to apply rules and strategies of what she had learned.

At first, during the pre-test and the first seven sessions of the **CEPP** (*cf.* Figure 5.4; Appendix 5) she could not plan her choices or apply the rules and strategies (*cf.* Appendix 6.24). From Session 8 onwards she understood the rules, worked more systematically and applied the transfer principles (*cf.* 2.3; Figure 5.12; Appendix 2: Sessions 8-12). She was eager to complete the activities and sometimes still made mistakes, but not so much as in the beginning. This is in line with what literature maintains regarding meta-cognition which is still emerging in the young learner between the ages of four and six (*cf.* 2.2.2) (Robson, 2006:84; Botha *et al.* 1990:276).

Participant 8 enjoyed working with numbers and could give examples of where one can use addition and subtraction, e.g. buying or losing something (*cf.* Figure 5.12; Appendix 5, 9, 10). She could create her own pattern of shapes (*cf.* Figure 5.12; Appendix 5). She could internalise if one Smartie was taken away from a group, how many would be left (*cf.* Figure 5.12; Appendix 2: Session 4).

She could see relations in objects, e.g. similarities and differences. Although she understood the principle of virtual relations from Session 8 onwards, she sometimes still projected it incorrectly (*cf.* Figure 5.12; Appendix 5), but showed signs of progression from Session 8 onwards.

Participant 8 never showed any sign of blocking behaviour. She showed no resistance to mediation. It seems that she developed from **Deficient (0)** cognitive functions where she was encouraged to apply or transfer already learned rules to other areas of content, to **Independent (9)** cognitive functions in the Output Phase where she fully internalised mediation, demonstrated self-regulation behaviour and reacted positively to stimuli (Table 5.1) (Benjamin, 2009).



### Non-intellective factors

Participant 8 did not have negative experiences regarding prior learning and was open to mediation. She never rejected my attempts to teach her. She did not show signs of previous negative experiences with a mediator or learning, because she never withdrew passively from learning (*cf.* 2.7.4.2) (Lerner & Johns, 2009:190; Nieman & Pienaar, 2006:94; Lerner, 2006:527). She showed persistence on tasks and intrinsic motivation to complete activities successfully. She could work independently and became more aware of her own thinking (*cf.* 2.2.2).

Participant 8 constantly showed positive behaviour and no frustration was present. From Session 8 onwards she showed more control over the execution of tasks and wanted to work out problems (*cf.* 2.2.2; Figure 5.12; Appendix 5). Although she was confident in her answers during the last post-test and delayed post-test, she showed no

fear of failure and expressed a high level of energy, vividness, attentiveness and interest.

Participant 8 showed a **medium to high** level of modifiability, since she required less explanations and prompts to recall learning from previous learning experiences (*cf.* 5.4.1.3; Table 6.1). She progressed from **Emergent (4)** to **Independent (9)** regarding Non-intellective factors and was also able to transfer learning and apply strategies (*cf.* Graph 5.1; 5.2).



### Reflection

As a consequence of the task demands (activities) in the **CEPP** (*cf.* Appendix 5), deficient cognitive areas in Participant 8 could be addressed, adjusted and modified. Due to her **unsystematic, impulsive and inaccurate** working behaviour (*cf.* Appendix 2: Session 1-5), she made numerous and unnecessary mistakes that affected her performance during the intervention, but which will also impact negatively on future performance in a formal teaching setting, such as Grade 1, if not rectified (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

She also tended to “forget” **rules and strategies** and struggled to **solve problems** due to her impulsive behaviour during Sessions 1-6 (*cf.* Appendix 2: Sessions 1-6). She also did not **verify** her work (*cf.* Appendix 2: Session 1-5) which contributed to unnecessary mistakes. Participant 8 also experienced difficulties in **predicting** answers and solutions and did not display hypothetical thinking (*cf.* Appendix 2: Session 1-6). Her verbal tools were good and she did not struggle with identifying sounds (*cf.* Appendix 5). However, her impulsive behaviour contributed to her inability to hear instructions out clearly. Her sometimes hasty and incorrect reaction to instruction may probably have been caused by her impulsiveness and was not an indication that her **auditory discrimination** was not sufficiently developed. All these factors disadvantaged her from performing well in the pre-test (*cf.* Appendix 3.2) and may

prevent her from reaching her potential in her school career, if not resolved in time (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

### **Task demands**

The task demands in the **CEPP** (*cf.* 6.4.2) assisted in rectifying Participant 8's cognitive deficiencies and replaced her impulsive and unorganised behaviour with self-regulation by means of planned comparative behaviour, verbal tools and hypothesis-testing techniques.

### **Content**

The **Content** in Session 1 of the **CEPP** required participants to recognise basic colours, such as blue, green, red, yellow, white, black and orange. Participants had to compare and classify the colours, learn new vocabulary, give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** optimised Participant 8's classification abilities, expanded her vocabulary (she had to name objects of specific colours). Since Participant 8 was not eager to verbalise her solutions, I motivated her continuously to explain her thoughts (*cf.* Figure 5.12; Appendix 2: Session 1).

The **Content** in Session 2 of the **CEPP** required participants to recognise basic colours, seriate and create patterns with their coloured disks. Participants had to recognise the colours, learn new vocabulary (e.g. *pattern*), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** developed Participant 8's seriation skills, expanded her vocabulary, but she still struggled to explain her decisions (*cf.* Figure 5.12; Appendix 2: Session 2).

The **Content** in Session 3 of the **CEPP** required participants to recognise basic colours and determine the position of objects in relation to other objects. Participants had to learn new vocabulary (e.g. above, behind, next to, etc), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** further optimised Participant 8 's spatial orientation and vocabulary. She began to verbalise her thoughts (*cf.* Figure 5.12; Appendix 2: Session 3).

In Session 4 the **Content** once again entailed colour recognition, comparison, classification, vocabulary (*more or less*, etc.), explanations and solutions. In this session new content, namely number quantity was addressed. Participants had to count the Smarties they received, categorise them in groups (according to colour), and determine which group contained the most sweets and which the least. Participants then had to put the Smarties on a graph (*cf.* Appendix 2: Session 4). Participant 8 performed well in this session and slowly began to share her thoughts (*cf.* Figure 5.12; Appendix 2: Session 4).

The **Content** in Session 5 involved colour recognition, vocabulary (triangle, rectangle, circle, square, and diamond), explanations and solutions. New content with regard to shape recognition, direction (left, right, next to, above, behind) and sequence were dealt with. Participants physically explored the characteristics of the various shapes (curved line, four equal sides, etc). Participant 8 performed well in this session (*cf.* Figure 5.12; Appendix 5).

In Session 6 the **Content** entailed shape recognition, relationships between shapes, comparing shapes, vocabulary, such as big, small, medium, big, bigger, biggest, etc. Participants had to arrange the wooden shapes according to size and explain what they did and why they arranged the wooden shapes the way they did. Participants also had to build 3D constructions where they had to plan which shapes, how many shapes and what size shapes they would need. During Session 6 Participant 8 still found it difficult to explain her actions and offer solutions verbally. The task demands of Session 6 optimised Participant 8's reflective behaviour (*cf.* Figure 5.4; Appendix 5).

The **Content** in Session 7 involved recall regarding colour, shape, relationships and characteristics of shapes. Participants had to assemble shape pieces to create a specific shape. Participant 8 systematically compared single pieces of shape to complete the activity. With encouragement, she explained her actions (*cf.* Figure 5.12; Appendix 5).

The **Content** in Session 8 required participants to discuss picture cards, categorise counters (according to colour), determine the number of counters, count them and match them to a counter, dot card, picture, and number name. While counting, the one-

to-one-correspondence concept was also instilled. Participant 8 could explain how many more or less counters she had and what she could do to make the counters equal. Participants also had the opportunity to pose simple problems regarding more or less. The task demands in Session 8 enabled Participant 8 to count, compare, estimate, explain, offer solutions and learn new vocabulary (*cf.* Figure 5.12; Appendix 5).

The **Content** in Session 9 required participants to compare counters, determine quantity, do simple addition sums, determine more or less. New vocabulary, such as *plus, more, put together, equal, estimate*, was learned. Participant 8 enjoyed working with numbers and her systematic working ways improved further. (*cf.* Figure 5.12; Appendix 5).

Session 10's **Content** included tasks demands, such as comparing counters, breaking down numbers, determining quantity, doing simple subtraction sums, determining more or less, giving explanations and offering solutions. New vocabulary, such as *minus, subtraction, less, take away, equal, estimate*, was learned. Although Participant 8 performed well when working with numbers, her skills further improved due to the task demands in Session 10 (*cf.* Figure 5.12; Appendix 5).

In Session 11 participants had to identify sounds already learned in their classroom setting. Participant 8 could identify all the sounds, but experienced difficulty in identifying beginning, middle and end sounds of three-letter words. At first she could not tell what a rhyme word was, but with mediation she quickly understood the concept. The task demands in Session 11 assisted in Participant 7's improved language skills, letter recognition, building up three-letter words, breaking down three-letter words, auditory discrimination, identifying beginning, middle and end sounds, comparing relationships between three-letter words and sounds, identifying rhyme words, giving explanations and offering solutions (*cf.* Figure 5.12; Appendix 5).

The **Content** in Session 12 facilitated Participant 8's direction, visual memory, categorisation, vocabulary, explanation and problem-solving capacity. The task demands in Session 12 helped her to distinguish between similarities and differences, to compare, match, explain, and offer solutions. She applied the strategies to

successfully remember visual objects by means of categorisation. The task demands also addressed and developed her spatial orientation (*cf.* Figure 5.12; Appendix 5).

### 😊 **Modalities: Sessions 1-12:**

**The modalities** utilised in Sessions 1, 2, 3, 5, 6, 7, 11 and 12 were figural, pictorial, verbal and symbolic. The modalities utilised in Sessions 4, 8, 9 and 10 included numerical modality. Although Participant 8 could execute instructions, which means that she understood the verbal instructions given to her, she preferred pictorial, figural and symbolic modalities.

### 😊 **Phases**

Since the **Input Phase** demanded accurate gathering of information, need for precision and accuracy, considering two or more sources of information, clear perception, receptive verbal tools and spatial and time orientation, activities presented during Sessions 1 – 12 addressed all of the above and enabled Participant 8 to develop throughout the **CEPP** from fragile to adequate in the Input Phase (*cf.* Figure 5.4; Appendix 5).

During the **Elaboration Phase**, participants' planning behaviour, selection of relevant cues to solve a problem, summative behaviour, pursuing logical evidence, hypothetical thinking and strategies, internalisation, memory, categorisation, comparison, problem-solving skills and relationships were observed. All the activities in the **CEPP** from Sessions 1 to 12 attended to the above. These task demands contributed to the fact that Participant 8 developed from fragile to emergent in the Elaboration Phase (*cf.* Figure 5.12; Appendix 5).

Behaviour observed in the **Output Phase** were egocentric communication, blocking behaviour, visual transport, projection of virtual relations, transfer of rules, clear and precise language, impulsive behaviour and precision and accuracy. The task demands in Sessions 1 to 12 of the **CEPP** all focused on the above which contributed to Participant 8's optimised ability in the Output Phase from fragile to adequate (*cf.* Figure 5.12 Appendix 5).

## 😊 Cognitive operations

Focus was placed on the following **Cognitive operations** in Sessions 1-12 of the **CEPP**: Categorisation, comparison, classification, planned systematic behaviour, problem-solving, hypothetical thinking, mental representation, seriation and critical reflection. Since some of the cognitive operations (categorisation, comparison, classification, planned systematic behaviour, problem-solving, and hypothetical thinking) were repeated in Session 2, Participant 8 had the opportunity to revise them and apply them together with the new cognitive operations, such as seriation and critical reflection (cf. Appendix 2: Session 1; Figure 5.12).

## 😊 Complexity, Abstraction and Efficiency

**Complexity, Abstraction and Efficiency levels** were low in Sessions 1-3, low to medium in Sessions 4-6, medium in Sessions 7-9 and medium to high in Sessions 10-12 (cf. Appendix 5).

Cognitive functions that **developed well** during the **CEPP** according to the different principles of mediation are the following (cf. 3.6):

Ψ **Mediation of individuation**: Participant 8 successfully work independently (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of regulation and control of behaviour**: Participant 8 worked in a self-reflective, controlled and planned manner (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of goal-seeking, goal-setting and goal-achieving behaviour**: Participant 8 was a motivated learner who wanted to achieve success (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

- Ψ **Mediation of transcendence:** Participant 8 successfully applied strategies and rules in new learning experiences (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- Ψ **Mediation of challenge:** Participant 8 could meet challenges set by task demands (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- Ψ **Mediation of an awareness of the human being as a changing entity:** Participant 8 became aware of her own progress and reflected on her work (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- Ψ **Mediation of the search for an optimistic alternative:** Participant 8 was very focused and realised that problems could be solved in various ways. She looked for alternative solutions when presented with a problem (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- Ψ **Mediation of meaning:** Participant 8 understood instructions and could pose questions to Participant 9. She possessed the verbal tools to understand the meaning of concepts (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- Ψ **Mediation of a feeling of belonging:** Participant 8, bonded with Participant 9 and began to listen to and respect Participant 8's answers (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Intentionality and reciprocity:** Although Participant 8 really developed into a self-reflective learner, this behaviour should be encouraged continuously (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:10; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

It is however important that these functions should be infused on a continuous basis in all future learning activities in order to be retained (*cf.* 6.3) (Feuerstein *et al.*, 2002:526).

I maintain that cognitive functions that still **need practice** and **attention** will improve if the following principle of mediation is optimised frequently:

Ξ **Mediation of sharing behaviour:** Although not yet fully developed yet, Participant 8 learned to explain her thoughts and actions to others and learned to give them a chance to explain their thoughts and actions. She should however be encouraged to share her thoughts spontaneously with others (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Attending to the above could eliminate the problematic cognitive functions.

In the first pre-test it took her **40** minutes to obtain a score of **14** (*cf.* Figure 5.13). She scored **19** in the first post-test and it took her **35** minutes to complete the test. The second pre-test took her **20** minutes and she could score only **8**. After the **CEPP** she completed the last post-test in **20** minutes and obtained a score of **25**. The delayed post-test was completed in **22** minutes and she obtained **30**. These results indicate that she performed quite well. Because some of the functions, as indicated above, are not yet involuntary, more exposure is necessary as she still needs to be reminded of her planning and impulsive behaviour. This means that the **CEPP** contributed to Participant 8's improvement in efficiency, her rapid response, and the precision and energy that she put into the tasks (*cf.* 5.4.1.1) (Feuerstein *et al.*, 2002:134-136).

An improvement in the nature and quality of cognitive change (*cf.* 5.4.1.2; Figure 6.4) in Participant 8 was evident (*cf.* 5.4.1.1) and she showed good progress in planned

working ways. She could also apply strategies and rules learned (*cf.* 5.4.1.2; Figure 6.4).

It seems that Participant 8 reacted positively to mediation and possesses the ability to flourish in a mediational classroom setting in which cognitive thinking is being developed. It also appears that retention took place and it looks as if Participant 8 benefited from the **CEPP** (*cf.* Figure 5.7) owing to her awareness of her own actions and improvement.

## 2.9 PROFILE: PARTICIPANT 9



### Input Phase

During the pre-test and the first seven sessions of the **CEPP** (cf. Figure 5.15; Figure 5.16; Appendix 2: Session 1-7) Participant 9 possessed no systematic thinking or behaviour and she could not make relations. She could not name *dress* and *bicycle* during the pre-test (cf. Appendix 4). She showed impulsive behaviour and lacked precision and accuracy. This links to the views of Epstein (2008:40), Lerner (2006:188) and Rivken, (2002:37) regarding impulsive learners who do not perform as well at school as reflective learners do (cf. 2.2.3.1). During the last post-test, she showed good progression. Although I had to remind her to check her work, she remembered the rules.

She could not consider all components of a task in a systematic way and could not understand instructions to categorise shapes according to size (cf. Figure 5.15; Figure 5.16; Appendix 5, 6). This correlates with what Benjamin (2009), Feuerstein *et al.* (2007:23, 24) and Tzurriel (2001:50-55, 72-73) maintain, namely that deficient cognitive functions lead to unplanned, unsystematic and impulsive exploratory behaviour (cf. 2.4).

She had no working strategies, and displayed vague and sweeping perceptions. She hurried through activities and therefore did not work accurately. She encountered problems with labelling of pictures and pronunciation and initially her verbal tools to process information were not good. She could not name *dress* and *bicycle* (cf. Appendix 4; Appendix 7). Although she listened carefully to instructions, the verbal tools lacked to explain the characteristics of the shapes (cf. Appendix 5). She could count with understanding, although she “skipped” some counters in the process. She did not understand the concepts *more than* or *less than* (cf. Appendix 5). With assistance she could add up to 5, but struggled somewhat to understand the concept of addition (cf. Appendix 5). With assistance she could do the subtraction sums – orally, concretely and abstractly (cf. Appendix 5).

Participant 9 struggled to identify sounds at the beginning, middle and end of a three-letter word. She could identify some of the sounds. After mediation, the beginning and end sounds improved, but she still struggled with the middle sound, e.g. “*b-u-s*”. She could not always name an object with the same sound (*cf.* Appendix 5). She also experienced difficulty in recognising sounds and pictures (*cf.* Figure 5.15; Appendix 5). She could not name objects that start with a specific letter, e.g. “*geel, gans, groot*”. She could identify some of the sounds (a, m, s, r, l, g), but could not identify “f, b, n, t, p, d, h, k”. Learners who experience difficulty in learning to read are unable to recognise or isolate the sounds of words or the number of sounds in a word, as was the case with Participant 9. These learners have trouble with phonological awareness and will encounter problems with reading and spelling (*cf.* 2.7.2) (Lerner & Johns, 2009:265). Literature advocates the importance of the development of phonological awareness during the pre-school years before learners are taught to read (Lerner & Johns, 2009:265-266; Lerner, 2006:341-342). Participant 9 found it extremely difficult to identify rhyme words, such as *mat* and *rat* which means that she could not recognise similarities in words. After mediation she could complete the activity (*cf.* Figure 5.15; Appendix 5). She could not name all the animals, but could categorise them correctly only with assistance (*cf.* Appendix 5).

Although she approached the pattern activity systematically and listened carefully to instructions, she did not always understand them. I had to repeat an instruction more than once in some cases (*cf.* Appendix 5). After the **CEPP** she showed very good progress.

Participant 9 struggled in Session 7 where she had to fit shape pieces into a shape. With mediation she could estimate which piece of the shapes should fit into the hole (*cf.* Appendix 5). Although she did not work systematically, she grouped the unifix blocks, picture and number cards correctly (*cf.* Appendix 5), although she sometimes made unnecessary mistakes. She was very dependent on the other group member, Participant 8.

Although Participant 9 counted the amount of shapes she would need to build the construction, she did not count correctly and therefore put out less shapes than

required (*cf.* Figure 5.15; Appendix 5 ; Appendix 7). To accurately observe is a cognitive skill at assessing reasonableness of ideas by assessing basic information, which still needs attention in Participant 9 (*cf.* Table 2.1 & Figure 2.3).

She did not possess the verbal tools to process information and complete activities. During the pre-test and the first seven sessions of the intervention programme she was not able to consider two sources of information at the same time (*cf.* Figure 5.15, 5.28; Appendix 5). This skill developed throughout the intervention programme. During the last post-test and delayed post-test she could compare objects simultaneously and was able to notice differences and similarities in shapes, letters, numbers and pictures (*cf.* 2.3 & Photo 2.7). This statement shows relation with literature (Eggen & Kauchak, 2010:40; Papalia *et al.*, 2008:269,270; Van Staden, 2005:53.54), namely that classification and categorisation skills of the pre-school learner should be intact (*cf.* 2.3).

Although Participant 9 could count from 1 to 10 and backwards (*cf.* 2.3; Figure 5.15; Appendix 2: Sessions 8-10), she struggled with simple addition, subtraction and estimation.

She showed impulsive behaviour by elaborating on topics that reminded her of her own experiences. Because of her impulsivity she sometimes completed activities incorrectly (*cf.* Figure 5.15; Appendix 2: Sessions 1-8). According to Benjamin, 2009, Feuerstein *et al.*, 2007:23, 24 and Tzuriel, 2001:50 – 55; 72-73, learners who experience problems with accuracy and a need for precision have deficient cognitive functioning in the **Input Phase**, which may continue in the Elaboration and Output Phases if not dealt with in time (*cf.* 2.4.1) After mediation, where I delayed her response while providing her with opportunities for considering all aspects of the problem, she could work more systematically, especially during the last post-test and the delayed post-test.

During Sessions 11 and 12 as well as the last post-test and delayed post-test (*cf.* Figure 5.15; Figure 5.16; Appendix 5, 12), she learned to look at all the possibilities carefully. She worked more cautiously and considered options and possible answers before making a final decision. Her planning became more systematic and she began to reflect on her answers and correct herself. She became more aware of her working methods, choices, actions and answers (*cf.* 2.2.2; Figure 5.15; Appendix 2: Sessions 11, 12).

Although her inferential thinking was emerging due to her impulsive behaviour, she sometimes realised its importance and really tried her best to work in a systematic, planned and accurate manner (*cf.* Figure 5.15; Appendix 5).

It appears that Participant 9 developed from **Deficient (0)** cognitive functions where she passively accepted the demand of the mediator to repetition, to **Adequate (6)** cognitive functions in the Input Phase where she applied previously used and semi-internalised strategies (*cf.* Table 5.1) (Benjamin, 2009).



### Elaboration Phase

Initially Participant 9 could not identify a starting point when solving problems (*cf.* Figure 5.15; Appendix 2: Session 1-7). She also did not work according to rules. No summative behaviour was present, because she did not estimate how many and which shapes she would need to complete her 3D construction (*cf.* Figure 5.15; Appendix 5, 6). She did not approach her work logically, could not make cues for rules and could not compare. After mediation, she showed more comparative behaviour. From Session 8 onwards she could compare options before deciding on a final answer (*cf.* Figure 5.3; Figure 3.5; Chapter 3.6.2.5; Appendix 5).

Participant 9 struggled to identify rhyme words. With mediation she could complete the activity. After many examples she could name some rhyming words and name objects that begin with a specific letter. She could make words with only 6 of the 17 sounds: a, m, s, r, l, g (*cf.* Figure 5.15; Appendix 5). She found the analysis and synthesis of words very difficult (*cf.* Figure 5.15; Appendix 5).

She found it difficult to think abstractly about the steps she should take to complete an activity (*cf.* Figure 5.15; Appendix 5). After a few intervention sessions, she could identify her mistake and correct it (*cf.* Figure 5.15; Appendix 2: Sessions 10-12). This behaviour was also evident in the last post-test and delayed post-test.

Initially Participant 9 could not explain her answers or communicate her thoughts. She had no step by step working procedure, could not find a strategy to solve problems and could not predict an outcome (*cf.* Figure 5.15; Appendix 2: Session 1-7), but after a few

intervention sessions she was more confident in her answers, was able to explain them logically, started to work more systematically and searched for strategies (*cf.* Figure 5.15; Appendix 2: Sessions 8-12). She was able to see the difference between shapes, and could verbalise the difference between a rectangle, square, triangle and circle (*cf.* Figure 5.15; Appendix 2: Sessions 5, 6).

During Session 5 (*cf.* Figure 5.15; Appendix 5) she could identify shapes hidden in a bag, and was able to explain the characteristics of the shapes. From Session 10 onwards she could work out a strategy to find the answers (*cf.* Figure 5.15; Appendix 2: Sessions 5, 6). Her hypothetical thinking seemed to be better when doing non-verbal activities. When I reminded her, she approached tasks more systematically. During the last post-test and the delayed post-test, she could explain her answers.

Her memory performance (*cf.* Figure 5.15) was fragile. She could remember **9** of the **24** pictures (*cf.* Figure 5.15; Appendix 4). After mediation 1 she could remember **7** of the **24** pictures and after mediation 2 she could remember **18** of the **24** pictures. During session 12 (*cf.* Figure 5.15; Appendix 5) where she had to categorise animals and try to remember the animals she during the activity she could remember **5** of the **24** pictures. After mediation she could remember **16** of the **24** pictures (*cf.* Figure 5.15; Appendix 5).

It could be argued that Participant 9 developed from **Deficient (0)** cognitive functions where she passively accepted the demand of the mediator to repetition, to **Adequate (6)** cognitive functions in the Elaboration Phase where she applied previously used and semi-internalised strategies and reflected on her work (*cf.* Table 5.1) (Benjamin, 2009).



### Output Phase

Participant 9 showed egocentric behaviour throughout Sessions 1-7 (*cf.* Figure 5.15). She could not separate the task at hand from her own world of experience. Because of mediation she could identify a starting point from Session 8 onwards, even though she sometimes still showed impulsive behaviour (*cf.* Figure 5.15). This compares with what literature says regarding MLE that can turn a cognitive deficient learner into an

independent and self-regulating learner (*cf.* 2.7.2.5) (Anon., 2008b; Fraser, 2006:9; Feuerstein, 1980:22).

Initially she did not learn according to rules and therefore gave a lot of trial and error responses. She struggled to think abstractly and still needed to figure things out concretely (*cf.* Figure 5.15; Appendix 2, **CEPP**: Sessions 1-7). From Session 8 (*cf.* Figure 5.153) onwards she started to apply rules and strategies of what she had learned.

Initially, during the pre-test and the first seven sessions of the **CEPP** (*cf.* Figure 5.15; Appendix 2, **CEPP**: Sessions 1-5), she could not plan her choices. From Session 8 onwards she could apply the rules and strategies. She understood the rule, worked more systematically and applied the transfer principles (*cf.* 2.3; Figure 5.15; Appendix 2, **CEPP**: Session 8-12). She was eager to complete the activities and sometimes still made mistakes, because she did not think about her answer. This is in line with what literature maintains regarding meta-cognition which is still emerging in the young learner between the ages of four and six (*cf.* 2.2.2) (Robson, 2006:84; Botha *et al.*, 1990:26).

Participant 9 struggled when working with numbers and initially could not give examples of where one can use addition and subtraction, e.g. buying or losing something (*cf.* Figure 5.15; Appendix 5). She could create her own pattern of shapes and worked easily from outside the working space to the working space (*cf.* Figure 5.15; Appendix 5). She could not internalise if one Smartie was taken away from a group, how many would be left, but after mediation she could complete the activity (*cf.* Figure 5.15; Appendix 2: Session 4).

Participant 9 never showed any sign of blocking behaviour. She was a friendly little girl who showed no resistance to mediation. It seems that she developed from **Deficient (0)** cognitive functions where she passively accepted the demand of the mediator to repetition, to **Adequate (6)** cognitive functions in the Output Phase where she applied previously used and semi-internalised strategies (*cf.* Table 5.1) (Benjamin, 2009).



## Non-intellective factors

Participant 9 was open to mediation. She never rejected my attempts to teach her. She did not show signs of previous negative experiences with a mediator or learning, because she never withdrew passively from learning (*cf.* 2.10.4.2) (Lerner & Johns, 2009:190; Nieman & Pienaar, 2006:94; Lerner, 2006:527). She showed persistence on tasks and intrinsic motivation to complete activities successfully. She constantly showed positive behaviour and no frustration was present. From Session 8 onwards she showed more control over the execution of tasks and wanted to work out problems (*cf.* 2.2.2; Figure 5.15; Appendix 5). She was confident in her answers during the last post-test and delayed post-test, showed no fear of failure and expressed a high level of energy, vividness, attentiveness and interest.

Participant 9 showed a **medium to high** level of modifiability, since she required less explanations and prompts to recall learning from previous learning experiences (*cf.* 5.4.1.3; Table 6.1). She progressed from **Fragile (3)** to **Self-regulated (7)** with regard to Non-intellective factors and was also able to transfer learning and apply strategies (*cf.* Figure 5.15; 5.26).



## Reflection

As a consequence of the task demands (activities) in the **CEPP** (*cf.* Appendix 5), deficient cognitive areas in Participant 9 could be addressed, adjusted and modified. Due to her **unsystematic, impulsive and inaccurate** working behaviour (*cf.* Appendix 5) she made numerous and unnecessary mistakes that effected her performance during the study, but which will also impact negatively on future performance in a formal teaching setting, such as Grade 1, if not rectified (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

Participant 9 also tended to “forget” **rules and strategies** and struggled to **solve problems** due to her **impulsive** behaviour during Sessions 1-6 (*cf.* Appendix 2: Sessions 1-6). She also did not **verify** her work (*cf.* Appendix 2: Session 1-5) which contributed to unnecessary mistakes. She also experienced difficulties in **predicting** answers and solutions and did not display **hypothetical thinking** (*cf.* Appendix 2: Session 1-6). She could not focus on an activity and had difficulty remembering objects she had seen (*cf.* Appendix 2: Sessions 1-6). Her verbal tools were not good and she struggled with identifying sounds (*cf.* Appendix 5) which may be an indication that her **auditory discrimination** was not sufficiently developed. All these factors disadvantaged her from performing well in the pre-test (*cf.* Appendix 3.2) and may prevent her from reaching her potential in her school career, if not resolved in time (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

### **Task demands**

The task demands in the **CEPP** (*cf.* 6.4.2) assisted in rectifying Participant 9’s cognitive deficiencies and replaced her impulsive and unorganised behaviour with self-regulation by means of planned comparative behaviour, verbal tools and hypothesis-testing techniques.

### **Content**

The **Content** in Session 1 of the **CEPP** required participants to recognise basic colours, such as blue, green, red, yellow, white, black and orange. Participants had to compare and classify the colours, learn new vocabulary, give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** optimised Participant 9’s classification abilities and expanded her vocabulary (she had to name objects of specific colours). Since Participant 9 was not eager to verbalise her solutions, I motivated her continuously to explain her thoughts (*cf.* Figure 5.15 Appendix 2: Session 1).

The **Content** in Session 2 of the **CEPP** required participants to recognise basic colours, seriate and create patterns with their coloured disks. They had to recognise the

colours, learn new vocabulary (e.g. pattern), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** developed Participant 9's seriation skills, expanded her vocabulary, but she still struggled to explain her decisions (cf. Figure 5.15; Appendix 2: Session 2).

The **Content** in Session 3 of the **CEPP** required participants to recognise basic colours, and determine the position of objects in relation to other objects. Participants had to learn new vocabulary (e.g. *above, behind, next to*, etc), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** further optimised Participant 9's spatial orientation and vocabulary, although she still did not want to verbalise her thoughts (cf. Figure 5.15; Appendix 2: Session 3).

In Session 4 the **Content** once again entailed colour recognition, comparison, classification, vocabulary (*more or less*, etc.), explanations and solutions. In this session new content, namely number quantity was addressed. Participants had to count the Smarties they received, categorise them in groups (according to colour), and determine which group contained the most sweets and which the least. Participants then had to put the Smarties on a graph (cf. Appendix 2: Session 4). Participant 9 performed well in this session and slowly began to share her thoughts (cf. Figure 5.15; Appendix 2: Session 4).

The **Content** in Session 5 involved colour recognition, vocabulary (triangle, rectangle, circle, square, and diamond), explanations and solutions. New content with regard to shape recognition, direction (left, right, next to, above, behind) and sequence were dealt with. Participants physically explored the characteristics of the various shapes (curved line, four equal sides, etc). Participant 9 performed well in this session (cf. Figure 5.15; Appendix 5).

In Session 6 the **Content** entailed shape recognition, relationships between shapes, comparing shapes, vocabulary, such as *big, small, medium, big, bigger, biggest*, etc. Participants had to arrange the wooden shapes according to size and explain what they did and why they arranged the wooden shapes the way they did. They also had to build 3D constructions where they had to plan which shapes, how many shapes and what size shapes they would need. During Session 6 Participant 9 still found it difficult

to explain her actions and offer solutions verbally. The task demands of Session 6 optimised Participant 9's reflective behaviour (*cf.* Figure 5.15; Appendix 5).

The **Content** in Session 7 involved recall regarding colour, shape, relationships and characteristics of shapes. Participants had to assemble shape pieces to create a specific shape. Participant 9 systematically compared single pieces of shape to complete the activity. With encouragement, she explained her actions (*cf.* Figure 5.15; Appendix 5).

The **Content** in Session 8 required participants to discuss picture cards, categorise counters (according to colour), determine the amount of counters, count them and match them to a counter, dot card, picture, and number name. While counting, the one-to-one-correspondence concept was also instilled. Participant 9 could explain how many more or less counters she had and what she could do to make the counters equal. Participants also had the opportunity to pose simple problems regarding more or less. The task demands in Session 8 enabled Participant 9 to count, compare, estimate, explain, offer solutions and learn new vocabulary (*cf.* Figure 5.15; Appendix 5).

The **Content** in Session 9 required participants to compare counters, determine quantity, do simple addition sums, determine more or less. New vocabulary, such as *plus, more, put together, equal, estimate*, was learned. Participant 9 enjoyed working with numbers and her systematic working ways improved further (*cf.* Figure 5.15; Appendix 5).

Session 10's **Content** included tasks demands, such as comparing counters, breaking down numbers, determining quantity, doing simple subtraction sums, determining more or less, giving explanations and offering solutions. New vocabulary, such as *minus, subtraction, less, take away, equal, estimate*, was learned. Although Participant 9 performed well when working with numbers, her skills further improved due to the task demands in this session (*cf.* Figure 5.15; Appendix 5).

In Session 11 participants had to identify sounds already learned in their classroom setting. Participant 9 could identify all the sounds, but experienced difficulty in identifying beginning, middle and end sounds of three-letter words. At first she could

not tell what a rhyme word was, but with mediation she quickly understood the concept. The following task demands in Session 11 assisted in Participant 9's improved language skills: letter recognition, building up three-letter words, breaking down three-letter words, auditory discrimination, identifying beginning, middle and end sounds, comparing relationships between three-letter words and sounds, identifying rhyme words, giving explanations and offering solutions (*cf.* Figure 5.15; Appendix 5).

The **Content** in Session 12 facilitated Participant 9's direction, visual memory, categorisation, vocabulary, explanation and problem-solving capacity. The task demands helped her to distinguish between similarities and differences, to compare, match, explain, and offer solutions. She applied the strategies to successfully remember visual objects by means of categorisation. The task demands also addressed and developed her spatial orientation (*cf.* Figure 5.15; Appendix 5).

#### **Modalities: Sessions 1-12:**

**The modalities** utilised in Sessions 1, 2, 3, 5, 6, 7, 11 and 12 were figural, pictorial, verbal and symbolic. The modalities utilised in Sessions 4, 8, 9 and 10 included numerical modality. Although Participant 9 could execute instructions, which means that she understood the verbal instructions given to her, she preferred pictorial, figural and symbolic modalities.

#### **Phases**

Since the **Input Phase** demanded accurate gathering of information, need for precision and accuracy, considering two or more sources of information, clear perception, receptive verbal tools and spatial and time orientation, activities presented during Sessions 1 – 12 addressed all of the above and enabled Participant 9 to develop throughout the **CEPP** from deficient to emergent in the Input Phase (*cf.* Figure 5.15; Appendix 5).

During the **Elaboration Phase**, participants' planning behaviour, selection of relevant cues to solve a problem, summative behaviour, pursuing logical evidence, hypothetical thinking and strategies, internalisation, memory, categorisation, comparison, problem-solving and relationships were observed. All the activities in the **CEPP** from Sessions 1 to

12 attended to the above. These task demands contributed to the fact that Participant 9 developed from fragile to emergent in the Elaboration Phase (*cf.* Figure 5.15; Appendix 5).

Behaviour observed in the **Output Phase** comprised egocentric communication, blocking behaviour, visual transport, projection of virtual relations, transfer of rules, clear and precise language, impulsive behaviour, and precision and accuracy. The task demands in Sessions 1 to 12 of the **CEPP** all focused on the above, which contributed to Participant 9's optimised ability in the Output Phase from deficient to emergent (*cf.* Figure 5.15; Appendix 5).

### 😊 **Cognitive operations**

Focus was placed on the following **Cognitive operations** in Sessions 1-12 of the **CEPP**. Categorisation, comparison, classification, planned systematic behaviour, problem-solving, hypothetical thinking, mental representation, seriation and critical reflection. Since some of the cognitive operations (categorisation, comparison, classification, planned systematic behaviour, problem-solving, and hypothetical thinking) were repeated in Session 2, Participant 9 had the opportunity to revise them and apply them together with the new cognitive operations, such as seriation and critical reflection (*cf.* Appendix 2: Session 1; Figure 5.15).

### 😊 **Complexity, Abstraction and Efficiency**

**Complexity, Abstraction and Efficiency levels** were low in Sessions 1-3, low to medium in Sessions 4-6, medium in Sessions 7-9 and medium to high in Sessions 10-12 (*cf.* Appendix 5).

Cognitive functions that **developed well** during the **CEPP** according to the different principles of mediation are the following (*cf.* 3.6):

#### Ψ **Mediation of goal-seeking, goal-setting and goal-achieving behaviour:**

Participant 9 was a motivated learner who wanted to achieve success (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

- Ψ **Mediation of challenge:** Participant 9 could meet challenges set by task demands (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- Ψ **Mediation of an awareness of the human being as a changing entity:** Participant 9 became aware of her own progress and reflected on her work (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- Ψ **Mediation of the search for an optimistic alternative:** Participant 9 became focused and realised that problems could be solved in various ways. She looked for alternative solutions when presented with a problem (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- Ξ **Mediation of meaning:** Participant 9 understood instructions and could pose questions to Participant 8. She possessed the verbal tools to understand the meaning of concepts (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- Ψ **Mediation of a feeling of belonging:** Participant 9 could go beyond her own immediate needs and link her experiences with others (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- Ψ **Mediation of transcendence:** Participant 9 successfully applied strategies and rules in new learning experiences (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

☒ **Mediation of sharing behaviour:** Although not yet fully developed, Participant 9 learned to explain her thoughts and actions to others and learned to give them a chance to explain their thoughts and actions. She should however be encouraged to share her thoughts spontaneously with others (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

It is however important that these functions should be infused on a continuous basis in all future learning activities in order to be retained (*cf.* 5.4.1.1) (Feuerstein *et al.*, 2002:526).

I maintain that cognitive functions that still **need practice** and **attention** will improve it the following principles of mediation are optimised frequently:

☒ **Mediation of individuation:** Participant 9 should be encouraged to work independently (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

☒ **Mediation of regulation and control of behaviour:** Participant 9 should be encouraged to work in a controlled and planned manner (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

☒ **Intentionality and reciprocity:** Participant 9 should be encouraged to be more self-reflective (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:10; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Participant 9 completed the first pre-test in **50** minutes and scored **12**. She completed the first post- test in **25** minutes and scored **8**. She completed the second pre-test in **15** minutes and she scored **10** points. After the **CEPP** intervention she completed the second post-test in **30** minutes and scored **28** points. The delayed post-test took her **27**

minutes and she scored **30**. This score proves that retention took place and that Participant 9 benefited from the **CEPP** (cf. Figure 5.15). This means that the **CEPP** contributed to an extent to Participant 9's improvement in efficiency, her rapid response, and the precision and energy that she put into the tasks (cf. 5.4.1.1) (Feuerstein *et al.*, 2002:134-136).

A good improvement in the nature and quality of cognitive change (cf. 5.4.1.2; Figure 6.4) in Participant 9 was evident (cf. 5.4.1.1) and she showed some progress in planned working ways. She could apply strategies and rules learned (cf. 5.4.1.2; Figure 6.4).

It seems that Participant 9 reacted positively to mediation and flourished in a mediational classroom setting in which cognitive thinking was being developed. It also appears that retention of cognitive functioning took place and it seems that Participant 9 benefited from the **CEPP** (cf. Figure 5.7) owing to her awareness of her own actions and improvement.

## 2.10 PROFILE: PARTICIPANT 10



### Input Phase

During the pre-test and first five sessions of the **CEPP** (*cf.* Figure 5.18; Figure 5.19; Appendix 5) Participant 10 possessed no systematic thinking or behaviour. He had no strategy, and displayed vague and sweeping perceptions. He hurried through activities and therefore did not work accurately. This correlates with what Benjamin (2009), Feuerstein *et al.* (2007:23, 24) and Tzuriel (2001:50-55, 72-73) affirm, namely that deficient cognitive functions lead to unplanned, unsystematic and impulsive exploratory behaviour (*cf.* 2.4). He encountered problems with labelling of pictures and he could not name *dress* (*cf.* Figure 5.18; Figure 5.19; Appendix 4; Appendix 3.1). After mediation all these aspects improved.

Participant 10 experienced difficulty in predicting possible answers, and could not distinguish between big and small shapes (*cf.* Figure 5.18; Figure 5.19; Appendix 7). He had difficulty visualising the answers and put out the shapes randomly. This shows a relationship with what Benjamin (2009), Feuerstein *et al.* (2007:23) and Tzuriel (2001:50-51) maintain, namely that learners who experience deficient cognitive functions in the **Input** Phase will demonstrate extensive and vague perception (*cf.* 2.4.1).

Participant 10 remembered and correctly identified colours and knew the airplane was up in the air and the ants below on the ground (*cf.* Figure 5.18; Appendix 2: Session 3). He could not associate the size of an object with various shapes (*cf.* Figure 5.18; Figure 5.19; Appendix 5) and although he could see similarities and differences, he could not explain them.

Although Participant 10 counted the amount of shapes required to build the construction, he did not count correctly and therefore put out less shapes than required (*cf.* Figure 5.18; Appendix 5 ; Appendix 7). To accurately observe is a cognitive skill at assessing reasonableness of ideas by assessing basic information (*cf.* Table 2.1 & Figure 2.3), which appeared to be underdeveloped in Participant 10.

He also experienced difficulty in recognising sounds and pictures and did not know what a rhyme word was (*cf.* Figure 5.18; Graph 5.30; Appendix 5). He could not name objects that start with a specific letter, e.g. “*tent, tien, toon*”, as well as words beginning with a “*k*” He could only make words that start with the letters “*p, r, b, d*”. He struggled to identify sounds at the beginning, middle and end of a three-letter word (*cf.* Figure 5.18; Figure 5.19 and Appendix 5). After mediation, the beginning and end sounds improved, but he still struggled with the middle sound, e.g. “*b-u-s*”. Learners who experience difficulty in learning to read are unable to recognise or isolate the sounds of words or the number of sounds in a word, as was the case with Participant 10. These learners have trouble with phonological awareness and will encounter problems with reading and spelling (Lerner & Johns, 2009:265). Literature advocates the importance of the development of phonological awareness during the pre-school years before learners are taught to read (*cf.* 2.10.2) (Lerner & Johns, 2009:265-266; Lerner, 2006:341-342). He also found it difficult to identify rhyme words such as *mat* and *rat*, which means that Participant 10 could not recognise similarities in words. After mediation he could complete the activity (*cf.* Figure 5.3; Appendix 5).

He possessed the verbal tools to process information and complete activities. He could identify which group of Smarties contained the most sweets and which the least (*cf.* Figure 5.18; Figure 5.19 & Appendix 2: Session 4). During the pre-test and the first five sessions of the intervention programme he was able to only consider two sources of information at the same time (*cf.* Figure 5.18, 5.31 ; Appendix 2: Session 1-5). This skill developed throughout the intervention programme, and during the last post-test and delayed post-test he could easily compare objects simultaneously and was able to notice differences and similarities in shapes, letters, numbers and pictures (*cf.* 2.3 & Photo 2.7). This statement correlates with literature (Eggen & Kauchak, 2010:40; Papalia *et al.*, 2008:269,270; Van Staden, 2005:53.54) regarding classification and categorisation skills that pre-school learners need to possess (*cf.* 2.3).

Participant 10 enjoyed working with numbers and could recognise and count from 1 to 10 and backwards easily (*cf.* 2.3; Figure 5.18; Appendix 2: Sessions 8-10). He could do simple addition and subtraction and estimate groups of not more than five.

He showed impulsive behaviour by elaborating on topics that reminded him of his own experiences. He elaborated on the meaning of pictures and asked many questions during all the sessions. Because of over-eagerness he sometimes completed activities incorrectly (*cf.* Figure 5.18; Appendix 2: Sessions 1-10). According to (Benjamin, 2009; Feuerstein *et al.*, 2007:23, 24; Tzuriel, 2001: 50 – 55; 72-73), learners who experience problems with accuracy and a need for precision have deficient cognitive functioning in the **Input Phase**, which may continue in the Elaboration and Output Phases if not dealt with in time (*cf.* 2.4.1) After mediation, where I delayed his response while providing him with opportunities to consider all aspects of the problem, he could work more systematically, especially during the last post-test and the delayed post-test.

During Sessions 11 and 12 as well as the last post-test and delayed post-test (*cf.* Figure 5.18; Appendix 5), he learned to look at all the possibilities carefully. He worked more cautiously and considered options and possible answers before making a final decision. His planning became more systematic and he began to reflect on his answers and correct himself. He became more aware of his working methods, choices, actions and answers (*cf.* 2.2.2; Figure 5.18; Appendix 5).

Although his inferential thinking was emerging due to his impulsive behaviour, he sometimes realised the importance of working accurately and really tried his best to work in a systematic, planned manner (*cf.* Figure 5.18; Appendix 5).

It can be assumed that Participant 10 developed from **Deficient (0)** cognitive functions where he passively accepted the demand of the mediator to repetition, to **Adequate (6)** cognitive functions in the Input Phase where he applied previously used and semi-internalised strategies (*cf.* Table 5.1) (Benjamin, 2009).



## Elaboration Phase

Initially Participant 10 could not identify a starting point when solving problems (*cf.* Figure 5.18; Appendix 5). He also did not work according to rules. No summative behaviour was present, because he did not estimate how many and which shapes he would need to complete his 3D construction (*cf.* Figure 5.18; Appendix 2: Sessions 5,

6). He did not approach his work logically. After mediation, he began to work more logically and started to select relevant information in order to solve a problem. From Session 8 onwards he could compare options before deciding on a final answer (*cf.* Figure 5.18; 3.6.2.5; Appendix 5). He listened to instructions carefully and showed more logical ways of working from Session 7 onwards (*cf.* Figure 5.18; 3.6.2.5; Appendix 5).

He could not select relevant cues for solving a problem and had difficulty in identifying a starting point when solving problems (*cf.* Figure 5.18; Appendix 5). After mediation, where I showed him to look for alternatives, he began to select cues. He experienced difficulty in identifying rhyme words, but after mediation he was able to identify words that sound the same. He found the analysis and synthesis of words very difficult (*cf.* Figure 5.18; Appendix 5).

Participant 10 found it difficult to think abstractly about the steps he should take to complete an activity (*cf.* Figure 5.18; Appendix 5). He first did it concretely; saw his mistake before he corrected it. He showed trial and error behaviour. After a few intervention sessions, he could identify his mistake and correct it (*cf.* Figure 5.18; Appendix 2: Session 6-12). This behaviour was also evident in the last post-test.

Initially he could not explain his answers or communicate his thoughts. He had no step by step working procedure, could not find a strategy to solve problems or predict an outcome (*cf.* Figure 5.18; Appendix 5), but after a few intervention sessions he was confident in his answers, was able to explain them logically, started to work more systematically and searched for strategies (*cf.* Figure 5.18; Appendix 5). He was able to see the difference between shapes, and could verbalise the difference between a rectangle, square, triangle and circle (*cf.* Figure 5.18; Appendix 2: Sessions 5, 6).

Participant 10 enjoyed working with numbers and understood the concept of addition and subtraction. He could do the classification with number, dot and picture. At first he completed activities randomly, later on he displayed the need to rethink his final answer – this had not been present in Sessions 1-5 (*cf.* Figure 5.18; Appendix 5, 9, 10).

During Session 5 (*cf.* Figure 5.3; Appendix 5) he could identify shapes hidden in a bag, and was able to explain the characteristics of the shapes. From Session 8 onwards he could work out a strategy to find the answers (*cf.* Figure 5.18; Appendix 5). He could

explain that if he had two sweets and he received three more, he would have more sweets. His hypothetical thinking seemed to be better when doing non-verbal activities. When I reminded him, he approached tasks more systematically. He was able to relate the function of an object to the size of the shapes, e.g. small circles to make the wheels and the big circle to make the head of the man – the same with the rectangles (*cf.* Figure 5.18 ; Appendix 5). During the last post-test and the delayed post-test, he could explain his answers.

Initially his memory performance (*cf.* Figure 6.4) was fragile. He could remember **9** of the **24** pictures (*cf.* Figure 6.4; Appendix 4). After mediation 1 he could remember **14** of the **24** pictures and after mediation 2 he could remember **16** of the **24** pictures. During session 12 (*cf.* Figure 6.4; Appendix 5) where he had to categorise animals and try to remember the animals he had seen during the activity, he could remember **3** of the 24 pictures. After mediation he could remember **21** of the **24** pictures (*cf.* Graph 5.30; Appendix 5). He showed progression in hypothetical thinking and internalising his thoughts (*cf.* Appendix 7).

It appears that Participant 10 developed from **Deficient (1)** cognitive functions where he was aware of the mediator's intervention, partially initiated action and successfully provided examples to **Adequate (6)** cognitive functions in the Elaboration Phase where he applied previously used and semi-internalised strategies (*cf.* Table 5.1) (Benjamin, 2009).



### Output Phase

Participant 10 showed egocentric behaviour throughout Sessions 1-6 (*cf.* Appendix 6.30). He could not separate the task at hand from his own world of experience. He could elaborate on what pictures reminded him of. He talked a lot about himself. I had to bring him back several times to focus on the task at hand. Because of mediation he could identify a starting point from Session 7 onwards, even though he sometimes still showed impulsive behaviour (*cf.* Appendix 6.30). This compares with what literature

says regarding MLE that can turn a cognitive deficient learner into an independent and self-regulated learner (*cf.* 2.7.2.5) (Anon., 2008b; Fraser, 2006:9; Feuerstein, 1980:22).

Initially he did not learn according to rules and therefore gave a lot of trial and error responses. He struggled to think abstractly and still needed to figure things out concretely (*cf.* Figure 5.18; Appendix 2: Session 1-7). From Session 8 (*cf.* Figure 5.3) onwards he started to apply rules and strategies of what he had learned.

At first, during the pre-test and the first five session of the **CEPP** (*cf.* Figure 5.18; Appendix 2: Session 1-5), he could not plan his choices, he made the choice first and then realised it was wrong. Later on he could apply the rules and strategies. He understood the rule, worked more systematically and applied the transfer principles (*cf.* 2.3; Figure 5.18; Appendix 5). He was eager to complete the activities and sometimes still made mistakes, because he did not think about his answer. This is in line with what literature maintains regarding meta-cognition which is still emerging in the young learner between the ages of four and six (*cf.* 2.2.2) (Robson, 2006:84; Botha *et al.*, 1990:26).

He enjoyed working with numbers and could give examples of where one can use addition and subtraction, e.g. buying or losing something (*cf.* Figure 5.18; Appendix 5). He could create his own pattern of shapes and worked easily from outside the working space to the working space (*cf.* Figure 5.18; Appendix 2, **CEPP**: Session 5). He could internalise if one Smartie was taken away from a group, how many would be left (*cf.* Figure 5.18; Appendix 2: Session 4).

No deficiency of visual transport was present. He could visualise change of directions, relations and connections internally when completing the activity where he had to match vehicles from various directions (*cf.* Figure 5.18; Appendix 5). He could make mental representations. He also could project virtual relations where he had to classify the coloured disks, e.g. he built a gun with the disks and explained why and how he built it (*cf.* Figure 5.18; Appendix 2: Sessions 1, 2, 3). He could see relations in objects, e.g. similarities and differences. Although he understood the principle of virtual relations, he sometimes still projected it incorrectly (*cf.* Figure 5.18; Appendix 2: Session 2), but showed signs of progression from Session 6 onwards.

Participant 10 never showed any sign of blocking behaviour. He was a friendly little boy who showed no resistance to mediation. It seemed that he developed from **Deficient (0)** cognitive functions where he passively accepted the demand of the mediator to repetition, to **Adequate (6)** cognitive functions in the Output Phase where he applied previously used and semi-internalised strategies (*cf.* Table 5.1) (Benjamin, 2009).



### Non-intellective factors

Participant 10 was open to mediation. He never rejected my attempts to teach him. He did not show signs of previous negative experiences with a mediator or learning, because he never withdrew passively from learning (*cf.* 2.10.4.2) (Lerner & Johns, 2009:190; Nieman & Pienaar, 2006:94; Lerner, 2006:527). He showed persistence on tasks and intrinsic motivation to successfully complete activities. He could work independently and became more aware of his own thinking (*cf.* 2.2.2). He constantly showed positive behaviour and no frustration was present. From Session 6 onwards he showed more control over the execution of tasks and wanted to work out problems (*cf.* 2.2.2; Figure 5.18; Appendix 5). He was confident in his answers during the last post-test and delayed post-test, showed no fear of failure and expressed a high level of energy, vividness; attentiveness and interest (*cf.* Figure 5.18).

Participant 10 showed a **medium to high** level of modifiability, since he required less explanations and prompts to recall learning from previous learning experiences (*cf.* 5.4.1.3; Table 6.1). He progressed from **Fragile (3)** to **Adequate (6)** regarding Non-intellective factors and was also able to transfer learning and apply strategies (*cf.* Graph 5.1; 5.2).



### Reflection

As a consequence of the task demands (activities) in the **CEPP** (*cf.* Appendix 5), deficient cognitive areas in Participant 10 could be addressed, adjusted and modified. Due to his **unsystematic, impulsive and inaccurate** working behaviour (*cf.* Appendix

5) he made numerous and unnecessary mistakes that effected his performance during the study, but which will also impact negatively on future performance in a formal teaching setting, such as Grade 1, if not rectified (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

Participant 10 also tended to “forget” **rules and strategies** and struggled to **solve problems** due to his impulsive behaviour during Sessions 1-6 (*cf.* Appendix 2: Sessions 1-6). He also did not **verify** his work (*cf.* Appendix 5), which contributed to unnecessary mistakes. He also experienced difficulties in **predicting** answers and solutions and did not display **hypothetical thinking** (*cf.* Appendix 2: Session 1-6). He could not **focus** on an activity and had difficulty in remembering objects he had seen (*cf.* Appendix 2: Sessions 1-6). Although his verbal tools were good, he struggled with identifying sounds (*cf.* Appendix 5), which may be an indication that his **auditory discrimination** was not sufficiently developed. All these factors disadvantaged him from performing well in the pre-test (*cf.* Appendix 3.2) and may prevent him from reaching his potential in his school career, if not resolved in time (Eggen & Kauchak, 2010:30; Donald *et al.*, 2010:15; De Witt, 2009:14,55; Lerner & Johns, 2009:247; Papalia *et al.*, 2008:10; Meier & Marais, 2007:191; Rademeyer, 2007:2; Lerner, 2006:220; Dunn, 2004; Van Hamburg & Swanepoel, 1987:86, 87).

Table 6.1 reflects a summary of the task demands included in the **CEPP** and the CITM (*cf.* Table 6.1; Appendix 2 Sessions 1-12; 5.2; 5.3; 5.4.1).

### **Task demands**

The task demands in the **CEPP** (*cf.* 6.4.2) assisted in rectifying Participant 10’s cognitive deficiencies and replaced his impulsive and unorganised behaviour with self-regulation by means of planned comparative behaviour, verbal tools and hypothesis-testing techniques.

## 😊 Content

The **Content** in Session 1 of the **CEPP** required participants to recognise basic colours, such as blue, green, red, yellow, white, black and orange. Participants had to compare and classify the colours, learn new vocabulary, give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** assisted Participant 10's classification abilities, expanded his vocabulary (he had to name objects of specific colours) and helped him to explain his decisions and to come up with solutions (*cf.* Figure 5.18; Appendix 2: Session 1).

The **Content** in Session 2 of the **CEPP** required participants to recognise basic colours, seriate and create patterns with their coloured disks. Participants had to recognise the colours, learn new vocabulary (e.g. *pattern*), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** assisted Participant 10's seriation skills, expanded his vocabulary and helped him to explain his decisions and to come up with solutions (*cf.* Figure 5.18; Appendix 2: Session 2).

The **Content** in Session 3 of the **CEPP** required participants to recognise basic colours, and determine the position of objects in relation to other objects. Participants had to learn new vocabulary (e.g. *above, behind, next to*, etc), give explanations regarding their actions and offer solutions. These task demands contained in the **CEPP** assisted Participant 10's spatial orientation, expanded his vocabulary and helped him to explain his decisions and to come up with solutions (*cf.* Figure 5.18; Appendix 2: Session 3).

In Session 4 the **Content** once again entailed colour recognition, comparison, classification, vocabulary (*more or less*, etc.), explanations and solutions. In this session new content, namely number quantity was addressed. Participants had to count the Smarties they received, categorise them in groups (according to colour), and determine which group contained the most sweets and which the least. Participants then had to put the Smarties on a graph (*cf.* Appendix 2: Session 4). Participant 10 performed very well in this session and he was eager to explain his decisions and give solutions (*cf.* Figure 5.18; Appendix 2: Session 4).

The **Content** in Session 5 involved colour recognition, vocabulary (triangle, rectangle, circle, square, and diamond), explanations and solutions. New content with regard to

shape recognition, direction (left, right, next to, above, behind) and sequence were dealt with. Participants physically explored the characteristics of the various shapes (curved line, four equal sides, etc). Participant 10 performed well in these sessions, since he could concretely manoeuvre the shapes (*cf.* Figure 5.18; Appendix 5).

In Session 6 the **Content** entailed shape recognition, relationships between shapes, comparing shapes, vocabulary, such as *big, small, medium, big, bigger, biggest, etc.* Participants had to arrange the wooden shapes according to size and explain what they did and why they arranged the wooden shapes the way they did. Participants also had to build 3D constructions where they had to plan which shapes, how many shapes and what size shapes they would need. During Session 6 Participant 10 also had to give explanations and offer solutions. The task demands of Session 6 aided Participant 10 in becoming a more reflective and critical thinker (*cf.* Figure 5.18; Appendix 5).

The **Content** in Session 7 involved recall regarding colour, shape, relationships and characteristics of shapes. Participants had to assemble shape pieces to create a specific shape. In doing this Participant 10 learned to compare, use vocabulary, explain his actions and come up with solutions (*cf.* Figure 5.18; Appendix 5).

The **Content** in Session 8 required participants to discuss picture cards, categorise counters (according to colour), determine the amount of counters, count them and match them to a counter, dot card, picture, and number name. While counting, the one-to-one-correspondence concept was also instilled. Participant 10 was given the opportunity to explain how many more or less counters he had and what he could do to make the counters equal. Participants also had the opportunity to pose simple problems regarding *more or less*. The task demands in Session 8 enabled Participant 10 to count, compare, estimate, explain, offer solutions and learn new vocabulary (*cf.* Figure 5.18; Appendix 5).

The **Content** in Session 9 required participants to compare counters, determine quantity, do simple addition sums, determine more or less. New vocabulary, such as *plus, more, put together, equal, estimate*, was learned. Participant 10 enjoyed working with numbers and although he sometimes tended to make unnecessary mistakes due to

over-eagerness, he learned to work in a more planned and systematic way (*cf.* Figure 5.18; Appendix 5).

Session 10's **Content** included task demands, such as comparing counters, breaking down numbers, determining quantity, doing simple subtraction sums, determining more or less, giving explanations and offering solutions. New vocabulary, such as *minus*, *subtraction*, *less*, *take away*, *equal*, *estimate*, was learned. Although Participant 10 performed well when working with numbers, his skills improved due to the task demands in Session 10 (*cf.* Figure 5.18; Appendix 5).

In Session 11 Participants had to identify sounds already learned in their classroom setting. Participant 10 did not perform well in this Session. He struggled to identify the sounds, rhyme words, beginning, middle and end sounds of three-letter words. The task demands in Session 11 contributed to Participant 10's improved language skills, letter recognition, building up three-letter words, breaking down three-letter words, auditory discrimination, identifying beginning, middle, end sounds, comparing relationships between three-letter words and sounds, identifying rhyme words, giving explanations and offering solutions (*cf.* Figure 5.18; Appendix 5).

The **Content** in Session 12 facilitated participants' direction, visual memory, categorisation, vocabulary, explanation and problem-solving capacity. The task demands in this session assisted Participant 10 to distinguish between similarities and differences, compare, match, explain, and offer solutions. The task demands also addressed and developed his spatial orientation (*cf.* Figure 5.18; Appendix 5).

#### 😊 **Modalities: Sessions 1-12:**

**The modalities** utilised in Sessions 1, 2, 3, 5, 6, 7, 11 and 12 were figural, pictorial, verbal and symbolic. The modalities utilised in Sessions 4, 8, 9 and 10 included numerical modality. Although Participant 10 could execute instructions, which means that he understood the verbal instructions given to him, he preferred figural and numerical modalities.

## 😊 Phases

Since the **Input Phase** demanded accurate gathering of information, need for precision and accuracy, considering two or more sources of information, clear perception, receptive verbal tools and spatial and time orientation, activities presented during Sessions 1 – 12 addressed all of the above and enabled Participant 10 to develop throughout the **CEPP** from deficient to emergent in the Input Phase (*cf.* Figure 5.18; Appendix 5).

During the **Elaboration Phase**, participants' planning behaviour, selection of relevant cues to solve a problem, summative behaviour, pursuing logical evidence, hypothetical thinking and strategies, internalisation, memory, categorisation, comparison, problem-solving skills and relationships were observed. All the activities in the **CEPP** from Sessions 1 to 12 attended to the above. These task demands contributed to the fact that Participant 10 developed from deficient to emergent in the Elaboration Phase.

Behaviour observed in the **Output Phase** comprised egocentric communication, blocking behaviour, visual transport, projection of virtual relations, transfer of rules, clear and precise language, impulsive behaviour, and precision and accuracy. The task demands in Sessions 1 to 12 of the **CEPP** all focused on the above, which contributed to Participant 10's optimised ability in the Output Phase from deficient to adequate.

## 😊 Cognitive operations

Focus was placed on the following **Cognitive operations** in Sessions 1-12 of the **CEPP**: Categorisation, comparison, classification, planned systematic behaviour, problem-solving, hypothetical thinking, mental representation, seriation and critical reflection. Since some of the cognitive operations (categorisation, comparison, classification, planned systematic behaviour, problem-solving, and hypothetical thinking) were repeated in Session 2, Participant 10 had the opportunity to revise them and apply them together with the new cognitive operations, such as seriation and critical reflection (*cf.* Appendix 2: Session 1; Figure 5.18).

## 😊 Complexity, Abstraction and Efficiency

**Complexity, Abstraction and Efficiency levels** were low in Sessions 1-3, low to medium in Sessions 4-6, medium in Sessions 7-9 and medium to high in Sessions 10-12 (*cf.* Appendix 5)

Cognitive functions that **developed well** during the **CEPP** according to the different principles of mediation are the following (*cf.* 3.6):

Ψ **Intentionality and reciprocity:** Participant 10 developed an interest in learning and reflected on and corrected his work (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:10; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of transcendence:** Participant 10 could apply strategies and rules in new learning experiences (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of meaning:** Participant 10 constantly asked questions in searching for meaning (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of competence:** Participant 10 became motivated to complete activities successfully and reflected on his work regularly (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of sharing behaviour:** During the **CEPP** Participant 10 learner to explain his thoughts and actions to others and learned to give them a chance to explain their thoughts and actions (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of individuation:** Participant 10 developed into an independent and creative learner (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of challenge:** Participant 10 became increasingly excited to engage in tasks and was not afraid of activities that were not familiar to him and regarded them as a challenge (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of an awareness of the human being as a changing entity:** From Session 6 onwards Participant 10 became more aware of his own progress and began to reflect on his work (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of the search for an optimistic alternative:** Participant 10 realised that problems could be solved in various ways and therefore started to look for alternative solutions when presented with a problem (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Ψ **Mediation of a feeling of belonging:** Participant 10 began to share his experiences and to realise that other people also have ideas and needs that should be respected. This experience assisted him to identify and bond with others (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:12; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

It is however important that these functions should be infused on a continuous basis in all future learning activities in order to be retained (cf. 5.4.1.1) (Feuerstein *et al.*, 2002:526).

Some cognitive functions still **need practice** and **attention** and I maintain that these aspects will improve if the following principles of mediation are optimised frequently:

- ☒ **Mediation of regulation and control of behaviour:** Although Participant 10's impulsive behaviour improved throughout the **CEPP**, he should still be reminded to exercise self-reflection and controlled and planned behaviour (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).
- ☒ **Mediation of goal-seeking, goal-setting and goal-achieving behaviour:** Since Participant 10 did not behave in a goal-directed way, this skill should be developed and promoted (Anon., 2008a; Feuerstein *et al.*, 2007:13; Fraser, 2006:11; Feuerstein *et al.*, 2005; Lidz, 2003:45; Deutsch, 2003:34-37; Tzuriel, 2001:25-27; Haywood, 1994:32-34; Feuerstein & Feuerstein, 1991:15-49).

Attending to the above could eliminate the problematic cognitive functions. .

In the first pre-test Participant 10 obtained a score of **9** and it took him **45** minutes to complete the test (*cf.* Figure 5.19). In the first post-test it took him **20** minutes to gain a score of **12**. He completed the second pre-test and it took him **20** minutes and he scored **14** points. After the **CEPP** intervention he completed the second post-test in **25** minutes and scored **36** points. The delayed post-test took him **27** minutes and he scored **35**. This score proves that retention took place and that Participant 10 benefited from the **CEPP** (*cf.* Figure 5.19). This means that the **CEPP** contributed to Participant 10's improvement in efficiency, his rapid response, and the precision and energy that he put into the tasks (*cf.* 5.4.1.1) (Feuerstein *et al.*, 2002:134-136).

An improvement in the nature and quality of cognitive change (*cf.* 5.4.1.2; Figure 6.4) was evident in Participant 10 (*cf.* 5.4.1.1) and he showed good progress in planned working ways. He could apply strategies and rules learned (*cf.* 5.4.1.2; Figure 6.4).

It seems that Participant 10 reacted positively to mediation and possesses the ability to flourish in a mediational classroom setting in which cognitive thinking is being developed. It also appears that retention took place and that Participant 10 benefited

from the **CEPP** (cf. Figure 5.7) owing to his awareness of his own actions and improvement.