Draft of CART

Natalie Southgate

Verna Mclaughlin

**New Teaching Strategies to improve Grade 2 and 3 learners understanding of the mathematical concept, Place Value.**

* 1. **RATIONALE**

The theories of teaching mathematics have evolved over the years. We as teachers are the products of rote learning which is a trait of the behaviourist theory. Both Thorndike and Gagne valued drilling in learning. The teacher therefore assumes an active role and learners followed their teacher’s processes to solve a problem (Orton, 38-40). Therefore, we experienced mathematics as being mechanical. We are now required to teach our children to think critically. This poses a major challenge for us as there is a mismatch with the theory of our teacher training and the theory of our new curriculum. We are thus grappling with teaching strategies which will allow our learners to construct mathematical understandings that they can use throughout their lives. Participating in the Collaborative Action Research Project thus gives us the opportunity to evolve as maths teachers.

The concept, Place Value (PV) is a critical aspect of mathematical understanding as it is the mechanics of our number system. Understanding the base-ten place –value system is one of the most important objectives in the early grades. Previously, our learners found it difficult to grasp the concept of PV. This impacted their computational skills as they struggled to invent their own computational methods when solving problems. The breaking up and building up of numbers in a myriad of ways posed a problem when solving addition and subtraction problems of 2-and 3- digit numbers.

The aim of this research is therefore to add new strategies to our teaching repertoire specifically, PV.

**Main Question:**

What new teaching strategies can we employ to improve of our Grade 2 and 3 learners understanding Place Value?

**2. Introduction and Background to our research**

Mathematics Education is currently in a state of flux and the origin of the problem could be traced back to Verwoerd's speech which he delivered on the Bantu Education Bill: "What is the use of teaching the Bantu mathematics when he cannot use it in practice?" (2005: 3). Education was thus used as a vehicle for disempowerment in the apartheid era.

Nelson Mandela's inauguration in 1994 signalled the dawn of a new era. It was a time in which we as South Africans not only gained our freedom by voting but also the year in which we entered the world arena after years of isolation. This political transformation not only impacted the socio- economic climate but inevitably altered the education policies of the land. According to Lemmer (2000: 3) we need to prepare the child for an economic future. Therefore, changing our curriculum was imperative as the government needed citizens who are equipped to compete on the world stage. Firstly, we needed to re-design a curriculum which did not promote learners who are self- regulatory but also to re-address the common practices of passive learning such as memorizing which included the skills of rote learning.

South Africa was faced with yet another problem namely unemployment. A possible solution to this problem would be to equip learners with the necessary skills to become successful entrepreneurs and thus being an asset to the economy (Gultig & Butler, 1999; 54). Mathematical knowledge, skills and understanding were needed to assist with the rebuilding of a new South Africa.

According to the Revised National Curriculum Statement (RNCS), the South African learner envisaged is someone who is confident, numerate, multi -skilled and able to participate in society as an active and critical citizen (RNCS,2002;8).The question however remains: How far are we in achieving the goals as set out in the RNCS?

We are currently teaching at Rocklands Primary, which is classified as a previously disadvantaged school. The school is situated in Mitchells Plain which is predominately a working class communiity where gangsterism and other “social evils” (drug, substance abuse, etc.) are rife. This contributes to the emotional state and academic performance of our learners. We are both teaching in the Foundation Phase, Grade 2 and 3 respectively. Our Grade 2 class consists of 45 learners and Grade 3 38.

At Rocklands Primary our learners are struggling with mathematics. According the Grade 6 Systemic Numeracy results (2009) only 18% of our learners were working at a Grade 6 level in mathematics (South Africa, Department of Education, 2009). This is of great concern to us as mathematics is an important life skill.

**3.METHODOLOGY**

A Qualitative Research Approach will be used to collect the data via: Learner Interviews, Pre- and Post- Testing, Observations, Journals and Analysing learners work.

**3.1 Learners Interviews**

We feel that learners are the recipients of our teaching yet their perceptions and feelings are seldom taken into consideration when planning lessons. Data collected from interviewing our learners will thus be valuable information. We hope to gain insight into: how our learners perceive themselves as maths learners, what part of the maths lesson they enjoy and if they can make a relation between maths and real life situations. This information will definitely inform our teaching.

Semi- structured interviews will be conducted within a focus group as we do not want our learners to feel intimidated in any way and it will be less time consuming. Furthermore, we feel that children can be unpredictable and therefore by using semi- structured interviews we will not be bound to structured questions. Only 9 learners per class, 3 per ability level will be interviewed. Due to learners with different maths abilities being interviewed we must be careful that stronger learners do not overtake the interview. The interviews will take place in our classrooms after school. This will be less disruptive and learners will feel more comfortable as the environment is familiar.

The interview will be recorded to validate information. This will also ensure that we listen to our learners and that they are not distracted.

**3.2 Pre- and Post Test**

A pre- and post test (the same test) will be administered to asses our learners understanding of PV. This will determine the effectiveness of our intervention strategies. The test will be a combination of practical and written tasks because young children’s understanding cannot be restricted to written activities. Furthermore, the explanations of their answers will give us deeper insight to their understanding. They are in the concrete operational stage of development and therefore it would be beneficial to use manipulatives in our assessment. The test will also form part of our daily math programme. This eliminates anxiety, fear, etc that our learners may have if it was done in ‘test like’ conditions.

**3.3 Observations**

Lessons will be observed by our critical friends namely, Lesley and Avril. They are both teachers in the higher grades and we feel that their input will be beneficial to our development. This is crucial as PV lays the foundation for Algebra and incorrect teaching of PV may create a barrier for our learners in the higher grades.

**3.3 Analyses of learners work**

During this time frame our learners work will be analysed to inform our teaching. We will assist each other as well as contact Tina and Anette, our Swedish critical friends, for assistance. Throughout this process we will do reflections in our journals.

**3.4. Ethics**

We will comply with the code of ethics as prescribed by the Western Cape Education Department. Kevin Sherman will assist us in this regard.

Please Comment!!!!

We welcome any comments as this will assist us in our research.

**Interview Questions**

**Self-Perception of Themselves**

What is your favourite subject in school?

When we do math, what part of the maths lesson do you like? give examples

What is one thing that's easy for you to do in math class? Why?

What is one thing that's hard for you to do in math class? Why?

**The Purpose of Math in Life**

When do you see people using math outside of the school day?

**How Do They Perceive Math**

What helps you to learn maths?

(Work with partner, use manipulatives, draw your thinking, not have to explain your thinking, using, working alone, having more time)

What would make you excited about math? Why?

**Action Plan**

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| **When** | **What** | **Critical Friend** | **Reflection** |
| 1: 02- 21:02 | Research Topic  Reflect on our understanding of PV.  How we taught it previously and barriers our learners had.  Working on lessons. | We discussed our understanding with each other as well as Lesley. | We found that discussions of literature led to a deeper understanding of the topic. |
| 22:02 | Meeting Kashief a Math Specialist at UCT.  Supported us in our understanding of PV as well the effective use of manipulatives. |  | Feeling confident of the topic as questions were answered.  Concerns about the topic were addressed. |
| 28:02 | Learner Interviews | Lesley to review our questions. |  |
| 1:03 | Pre- Test | Tina and Anette via Facebook and e-mail |  |
| 3:03- 24:03 | Lessons | Skype Tina and Anette on 10th  Skype Sandra, Mi and Janne date to be confirmed |  |
| 28:03 | Post- Test |  |  |