

*Improving Practice in Primary Science  
Education Through Participatory Action  
Research*

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# Definition of CPD – Day (1999)

- *"...consists of all natural learning experiences and those conscious and planned activities which are intended to be of direct or indirect benefit to individual group or school, which contribute, through these, to the quality of education in the classroom".*

# Collaborative Continuing Professional Development

- Positive impact on teaching - (Cordingley & Bell, 2003; Cordingley, Bell, Rundell & Evans, 2005)
- Superior to individual CPD - Cordingley et al. 2005)
- Positive impact on student achievement - (Cordingley, Bell, Isham, Evans & Firth, 2007; Timperley et al., 2007; Bell et al. 2010)

# Strategies for Improving Professional Skills (JTC, 2011)

- collaborate with peers to critically examine one's performance and create a framework for improvement
- rigorously assess one's performance in the teaching learning process,
- seek out and pursue opportunities for improving mastery of content and methodology

# Approaches to CPD

- 1-2 day workshops
  - Not suitable for sustaining and transforming practice
- action research and collaborative action research serve to support teachers during practice (Crippen et al. 2010; Kennedy, 2005; Timperley, 2006)

# Framework for Teacher Learning

Bell and Gilbert (1996)

- Processes involved in teacher learning involve:
  - Confirmation and desiring change
  - Reconstruction
  - Empowerment.

# Main Question

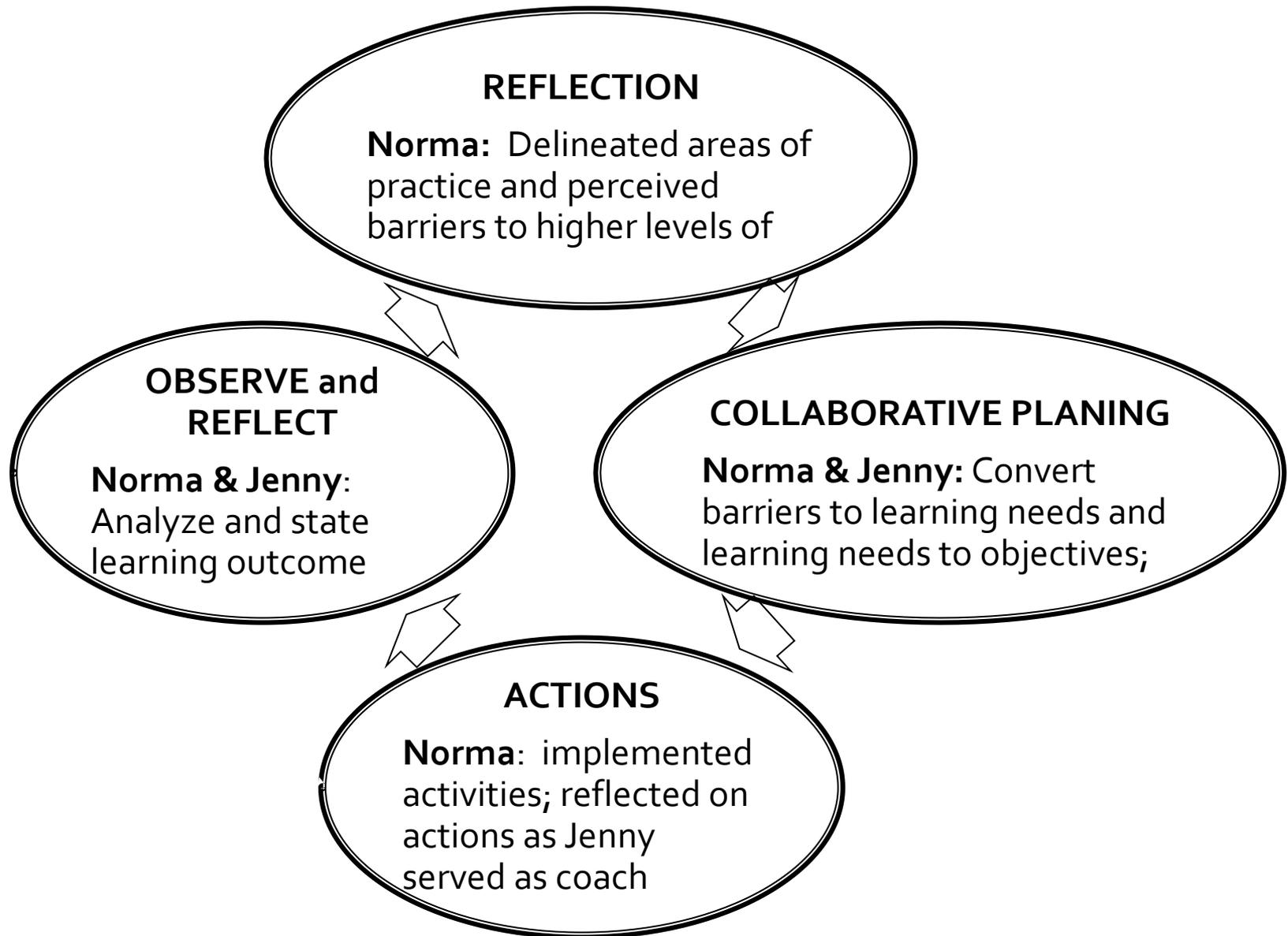
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How does participatory action research (PAR) facilitate change in teacher practice and enhance teacher learning?

# Elements Incorporated in the Design

(Cordingley et al. , 2005)

- the use of external experts linked to the school-based activity
- the use of observation and reflection
- an emphasis on peer support
- structured professional dialogue
- scope for the teachers to identify their CPD needs
- adequate time to enable teachers to embed the practices in their own classroom setting (see p. 6
- *outgrowth from previous research*



# Confirming her desire for change

- “I believe that children at my school are capable of doing much better at science than they are doing now. We need somebody to take the lead in improving how science is taught here. I would love to lead the way at Grade 4; to inspire teachers to work together ...”
- “However, I have some shortcomings that need to be addressed first – I need to understand some of the concepts which we have to teach and how to use strategies of cooperative learning groups, practical activity and the project “

# Confirming her desire for change

- “I saw this [referring to PAR] as adrift from what happens in the traditional workshops. I thought here is a situation where I could capitalize. In all the schools the teachers were saying that the workshops are not working. They were not transferring their knowledge and skills back to the classroom. And here it is where a teacher wanted to learn and I was a teacher educator. I thought I could sharpen my skills in that area.”

# Reconstruction

- “In the way I analyze how student teachers operate – Students are exposed to many ideas such as student-centeredness, student-student interactions etc... teachers are not transferring what they have learnt to their practice... I no longer just take things for granted what the student teachers say they do...”

# Where did the water come from?

Jenny: ... where did the water on the containers come from in the first place?

Norma: From inside the containers.

Jenny: Am I to understand that the water passed through the sides of the containers to get outside?

Norma: Where else would it come from?

# Revised response to question

- Norma: I now realize that water droplets around the glass were formed by water vapour in the air around the glass. When this water vapour came into contact with cold glass, it condensed. Water therefore did not seep through the glass. In a similar way, dew was formed when water vapour nearer to the surface of the earth condensed in the colder morning temperatures. Dew does not fall from the clouds.
- (Excerpt of interview between Norma and Jenny, January 18, 2008)

# Empowerment

- Jenny: We got together to plan lessons as we began to look at the objectives. Prior to that, she did not make connections between the various elements of the science lessons. She would write the focus questions down and focus on the content. Now she was beginning to analyze the unit; how the various parts come together. In analyzing the units in that way we created unit plans.

# Empowerment

- Jenny: I felt a sense of accomplishment. I had read a lot in the literature where people in countries such as Japan and Hong Kong were engaging in observing lessons. Here I came face to face with a situation where I was doing that. I could not believe that it was working in my own context. Doing something that you had read about happening somewhere else and doing something – being a part of it made it rewarding. This is propelling me to get more involved with teachers on the job – implementing of the curriculum, stirring me to advocate for change...

# Implications of using PAR for CPD

- This type of professional activity will more likely take place where a culture of teacher research exists and enjoys the support of senior members of the school community.
- The reflexive and cyclical nature of PAR serves to sustain the CPD process as it facilitates immediate and ongoing action, and therefore “emancipates” the teacher to have greater control and autonomy over solving the problem.

# Implications of using PAR for CPD

- This relationship has to be properly guarded as one has to wear two hats, one of expert /coach and one of peer. At times these two roles may be blurred which could be positive, leading to greater trust. On the other hand it could also lead to greater dependence making it more difficult for the expert to leave the field and for the teacher to grow from the process.

# Implications of using PAR for CPD

- **The role of empathy - Jenny's growth and resolve to make adjustments to her practice as a teacher educator came from the empathy that developed from her entry into the real life experiences of Norma.**

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■ THANK YOU!