

# EXPLORING FUNCTIONINGS AND CONVERSION FACTORS IN BIODIVERSITY TEACHERS PROFESSIONAL LEARNING COMMUNITIES

Sirkka Tshiningayamwe's study explored the conversion factors, functionings, agency and structures in PLCs for Life Sciences teachers' biodiversity knowledge. Conversion factors are the factors that can allow people to convert resources to new functionings (Robeyns, 2005). Functionings refers to "the various things a person may value doing or being" (Sen, 1999:75). These are practical realisations of one's chosen way of life. Agency is the ability to act according to what one values or in Sen's words – "what a person is free to do and achieve in pursuit of whatever goals or values he or she regards as important" (Sen, 1985:206) and structures refers to the material aspect of things such as resources and the way people and things are socially organised (Archer, 1995).

Using three PLCs in South Africa, Sirkka was interested in exploring the Life Sciences teachers' valued beings and doings as well as conversion factors associated with these beings and doings within the conceptual framework of the capability approach (Sen, 1999). Three PLCs used in the study were in Grahamstown, Idutywa and Cape Town.

The PLCs were course initiated and were positioned in the Fundisa for Change programme. To illuminate enabled and constrained capabilities and how and to what extent the Life Sciences teachers' empirical actions are related to these, the concepts of the capability approach were underlaboured with critical realism's causal view of human action (Tao, 2013). A critical realist theory of causation was useful in explaining how the teachers' valued beings and doings, conversion factors and capability sets, teachers' valuable beings and doings (Sen, 1999) can be partly accounted for via an understanding of underlying mechanisms that are generative of events and empirical experience.

Sirkka's research used a qualitative case study approach. Interviews, questionnaires, observations, document reviews and reflection tools were used to collect data. The data was analysed using the critical realism modes of inference (induction, abduction and retroduction). The study observed four main functionings valued by teachers, namely: subject content knowledge, teaching practices, assessment practices, and the teaching and learning support materials. This was for example reflected in a teacher from Grahamstown who expressed in her interview that her participation in the PLC activities was: *"to have more information about biodiversity, why it is important to conserve species and how to teach and assess it... as well as to get teaching materials on biodiversity"*. The valued functionings were discussed in light of the beings and doings in the PLCs and the underlying mechanisms related to teachers' biodiversity teaching.



*Teachers participating a group activity in a PLC*

Conversion factors that were associated with the teachers' valued beings and doings in the PLCs were discussed in line with capability approach's environmental, social and personal conversion factors (Sen, 1999). It was evident in Sirkka's study that most of the conversion factors within the PLCs and the Fundisa for Change programme (good facilitation, collaborative learning space, site where PLC activities happened, individual teachers' capabilities, teaching and learning support materials and policy documents) were enablers to the teachers' capabilities for biodiversity teaching, and thus enhanced teachers' knowledge for biodiversity teaching. This was for example revealed by a teacher from Cape Town who expressed that: *"the facilitators helped in explaining what assessment is and the different forms of assessment...and it was good to interact with others, discussing challenging topics, and sharing information about how they should be taught"*.



*Teachers participating a group activity in a PLC*

Sirkka's study further found that teachers realised some of their achieved functionings in their actual teaching of biodiversity content in the Life Sciences curriculum. For example, a teacher from Idutywa stated that: *"my knowledge was too little, but now I know what is meant by biodiversity and that there are different species found in different river ecosystems..."*. Lack of resources, large class sizes, learners' abilities and lack of interest among some teachers were some of the factors that constrained teachers' realisation of their achieved functionings in the PLCs. The factors enable the expansion of teachers' capabilities (in this case their biodiversity knowledge, pedagogical and assessment practice as well as other capabilities) in ways that have the potential to positively reshape teachers' classroom practices (in this case related to the teaching of biodiversity).

The study therefore revealed that when professional development programmes take account of underlying mechanisms and respond to teachers' capabilities (in this case their valued functionings for biodiversity teaching in the Life Sciences curriculum), they can be an important conversion. In conclusion, good facilitation, policy documents, collaborative learning space and teaching and learning support materials are conversion factors in PLCs.

## REFERENCES

- Archer, M. S. (1995). *Realist social theory: The morphogenetic approach*. Cambridge: Cambridge University Press.
- Robeyns, I. (2005). The capability approach: A theoretical survey. *Journal of Human Development*, 6(1), 93-114.
- Sen, A. (1985). *Commodities and capabilities*. Amsterdam: North Holland.
- Sen, A. (1999). *Development as freedom*. Oxford: Oxford University Press.
- Tao, S. (2013). *Rethinking teacher quality: Using the capability approach and critical realism to provide causal explanations for teachers practice in Tanzania*. Unpublished doctoral, University of London, London.