

Danelda Celeste van Graan (MPhil)

EXPLORING INQUIRY-BASED EDUCATION IN A PROFESSIONAL LEARNING PROGRAMME FOR SCIENCE TEACHERS

Most learners, especially in the senior school years, shy away from the Sciences as a subject as it is regarded as a too difficult subject. Yet, we are surrounded by science and our daily activities often include science. Could the subject be deemed too difficult because of how it is presented as a subject? Has the subject been reduced to sets of abstract theories and formulae without making the connection with how the formulae ties in with the countless daily processes we see in nature and life?

For many years Sciences has been taught in a more formal way, primarily focussing on memorising formulae and manipulating it, and as a result the wonder of Science has been reduced to numbers, making it less appealing and difficult to understand.

Inquiry-based Education (IBE), and so, Inquiry-based Science Education (IBSE) allows learners to explore, question, think and share. Humans are inquisitive by nature. This curiosity can be drawn upon to give learners a more authentic experience when learning about Sciences. Not only does this awaken an interest in Sciences, but it also awakens a desire to want to know more, to ask questions and to be astounded by the way the world works.

Since IBSE is an uncommon approach to teaching in South Africa, its implementation must begin with the teacher. In this action research study, the participating teachers had the opportunity to learn about and implement IBSE. They were firstly observed teaching a lesson and interviewed, prior to introducing them to IBSE. A model learning programme was designed and followed with the participating Sciences teachers. Teachers were then given the opportunity to implement aspects of IBSE into their own sciences lessons. Further mentoring and learning opportunities were given to the teachers and after another period of implementation the teachers were observed and interviewed again. Comparisons of the observations and interviews prior to and after the IBSE learning programme were used to identify if the learning opportunities and the shift to using the IBSE teaching methodology had an effect on the participating teachers' perception of Sciences and/or their practice of teaching Sciences.

Some of the main findings from the study is:

1. The learning model for teachers was effective, yet the mentoring phase could be developed more and could have been more intentional.
2. That teachers' perception about learners has shifted from seeing
 - learners as lazy and disruptive, to keen and able to learn by themselves
 - learners as not having much background/prior knowledge to having a good bank of information to build upon.
3. That IBSE is an effective way of teaching Sciences, which does lead to
 - more interest from learners
 - better understanding of topics
 - more opportunity to develop key thinking skills, communication skills
 - opportunity to teach learners about teamwork and collaboration.

The project provides sufficient evidence that an IBSE teacher learning programme, with the supportive elements of collaboration and regular mentoring, can have far-reaching effects in bringing about change in the sciences classroom.