

DECLARATION

I submit this research report in fulfilment of the requirements for the Degree of Master of Science at the University of the Witwatersrand. I declare that, apart from the assistance acknowledged, this research is my own unaided work. All sources that I have used or quoted have been acknowledged by means of complete citation and referencing. I further declare that I have not submitted this research report for any other degree or examination at any other university.



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ABSTRACT

This research explores the potential influence of *Life Sciences* teacher curriculum support materials on unscientific ideas about evolution by natural selection. The Curriculum and Assessment Policy Statement document, seven learner *Life Sciences* textbooks and their seven teacher guides were investigated by content analysis to find out firstly, the nature and extent of misconceptions about evolution; secondly, the nature and extent of latent problems associated with the topic of evolution; thirdly, the extent to which the Grade 12 *Life Sciences* textbooks pointed out common misconceptions and went on to provide the correct scientific explanations to counter the misconceptions; and fourthly, the extent to which teacher guides address teachers' pedagogical content knowledge (PCK) for teaching the topic of evolution by a) pointing out common misconceptions; b) providing the correct science to counter a specific misconception; c) pointing out pre-requisite knowledge which ought to be learnt first in order to understand the topic of evolution; d) pointing out typical difficulties students encounter when learning the topic of evolution. The Grade 10 and 11 textbooks and teacher guides were analysed for fragmentation and sequencing by use of a checklist.

The results show the presence of manifest errors and latent problems in the CAPS document, textbooks and teacher guides. The CAPS document had one manifest error and five instances of latent problems. The section on alternatives to evolution was judged to be a manifest error because religious ideas are not regarded as science by the scientific community. The manifest error found in the CAPS document was also found in the textbooks and teacher guides. Frequent manifest errors occurred in the textbooks, averaging 11 per publisher. The CAPS document had fragmented evolution ideas and probably because textbook authors use this document to write their books, the evolution content in textbooks was also found to be fragmented. Whilst some of the teacher guides were found to address the issue of teacher PCK for teaching the topic of evolution in different ways, some of them were found to be deficient in that respect.

The presence of latent problems across all the three curriculum support materials investigated is a cause for concern. Latent problems are problematic if not handled with care because they pose a risk of being misinterpreted, and this may in turn cause the development of evolution misconceptions.

An investigation of whether the unscientific evolution ideas in the curriculum documents actually influenced learners' evolution ideas was not part of this study. However, because textbooks are generally considered as authoritative sources of knowledge upon which teachers and students rely, the presence of misconceptions in these curriculum support materials poses a risk that users of such documents could pick up these misconceptions during teaching and learning.

The study highlights the need for a multifaceted approach involving all relevant stakeholders (teachers, authors, publishers and the Department of Education officials) working together in an attempt to address the problem of evolution misconceptions in the *Life Sciences* curriculum support materials.

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DEDICATION

This work is dedicated to my twin boy and girl Mthabisi and Sthabiso born at a time when I was busy with this project.

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