

https://dspace.org/

Representation of moon phases : a textbook analysis and case study of Grade 8 learners understanding

Bhulana, Lubabalo Albert

2014-03-05
http://hdl.handle.net10539/14030

Downloaded from a DSpace repository. https://dspace.org/

ABSTRACT

The aim of the study was to investigate the quality of diagrams and explanations of moon phases in grade 6 to 8 Natural Science textbooks; to establish whether the textbooks provide scientifically correct content information for learners and teachers and to investigate whether the textbooks used for teaching are effective conceptual development tools for grade 8 learners, specifically when exploring moon phases. The research consisted of two phases, where the first phase investigated the quality of textbooks, and the second phase investigating learners' ideas about moon phases.

In the first phase, six textbooks were analysed, with varying results. The two grade 6 textbooks analysed introduced cultural stories in an attempt to show how stories were used to help people understand moon phases. The cultural stories looking at scientific application, only achieved to explain the waxing and waning process the moon undergoes. Those stories however failed to explain correctly the cause of the moon phases. The diagrams presented in the textbook are misleading, as either the moon phase sequences are incorrect, or wrong moon diagrams are put for a particular phase. The activities though must be complimented, as they are good activities that would help learners understand the cause of moon phases a bit better. The remainder of the four textbooks, two grades 7 and two grades 8 did not include cultural stories. In terms of content accuracy, it was analysed that the correctness increased the higher the textbook grade was.

In the second phase, it was investigated whether a textbook prescribed to learners at school would help learners understand the concepts on the phases of the moon. For this purpose, 8 learners were chosen to be interviewed. The interview involved learners being given a model of the sun, earth and the moon: where they were to use the models to show the relative position of the sun, earth and the moon for certain moon shapes that came directly from their textbooks. Results from the interview show that all learners had little understanding of concepts relating to the moon. This showed that a textbook alone was not a sufficient tool to help learners understand all aspects relating to the phases of the moon.

The findings of the two phases bring out the following implications:

- Much needs to be done by tertiary institutions in equipping pre-service teachers with content knowledge that would help them identify misconceptions that arise in textbooks, so as to make sure that the misconceptions contained in textbooks are not passed down to learners that they teach.
- Tertiary institutions should also strive to equip pre-service teachers with pedagogical skills that would help them design instruction that would help address learners' misconceptions in relation to the phases of the moon.
- There needs to be intervention by provincial departments of education, in helping to equip current teachers by means of workshops with pedagogical content knowledge in regards to the phases of the moon, and Astronomy education in general.
- Textbooks prescribed by schools and government to learners, need to be taken to content specialist. This will help in providing textbooks that are more scientifically accurate, and help decrease misconceptions being passed on to learners.