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The significance of visual literacy in improving science literacy

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Abstract

Science knowledge is valued as a platform to equip learners with problem-solving skills, and conceptual knowledge of science. The skills to solve problems are crucial to adapting and thriving in the ever-changing world. Over the years, technological advances have contributed to a significant increase of images in the print and electronic media and our everyday life. As such it is not surprising that there are also more images used in science textbooks than before. Since visual literacy is customarily the domain of the arts, science learners are not explicitly taught how to interpret the images that are prevalent in the science textbooks. Hence the main question of this research is how could developing visual literacy skills develop science literacy? In order to answer the main question, I explored the following sub-questions: What is visual literacy?; What is science literacy?; What types of visual representations are used in the Grade 8 Natural Sciences textbooks and how frequently are the different types used for different sub-topics?; In what ways do the visual representations work to explain science concepts?

This is a conceptual study in the interpretivist paradigm. A purposive sample of 5 textbooks with the focus on the topic of "Visible light" was used. An analysis based on Barthes's (1997) and Rose's (2001) methods for visual analysis was used to analyse three categories of images, namely iconic images, schematic diagrams and graphs and charts. It was found that iconic diagrams are used to present everyday knowledge whereas the schematic diagrams are used to represent abstract science knowledge, and the graphs and charts are used to communicate numerical data. The results showed that all the books start by presenting everyday knowledge using iconic diagrams followed by the schematic diagrams and graphs and charts showing abstract knowledge. This progression helps learners to understand new science concepts as they build on their prior knowledge.

In conclusion, I suggest that learning how to decode images will help learners to better grasp the science content. This study contributes to highlighting the need to include visual literacy in educator training programmes in science disciplines. There is also a need to research the visual literacy skills of both teachers and learners in order to determine the best visual literacy framework to be incorporated into the formal curriculum.