

The Use of Analogies in Biology and Chemistry at Secondary School Level

This research study investigates teachers' perceptions on the use of analogies in the teaching of biology and chemistry at secondary school level. Three main research questions were identified: 1) What do biology and chemistry teachers think about the use, benefits and limitations of analogies? 2) What are the teachers' perspectives on using analogies to introduce/explain a topic? 3) What are the teachers' perspectives on students constructing analogies?

Biology and chemistry teachers from both the church and state school sectors were invited to answer an online questionnaire; the questionnaire was divided into two sections. The first section yielded descriptive statistics including the advantages and disadvantages associated with the use of analogies; an account of different analogies cited by teachers; and the topics/concepts in which teachers mostly make use of analogies. The second section consisted of Likert scale items that led to inferences about the teacher population, whenever statistically significant results were obtained. This data was also used for comparative analyses between teachers who teach biology, chemistry or both subjects. Five interviews per subject were carried out for a deeper insight relating to research questions 2) and 3).

The teachers' interviews consisted of a discussion on a students' worksheet consisting of two main sections: a given analogy for a topic in biology and chemistry and students constructing an analogy for a given topic in biology and chemistry. The majority of teachers agreed that, considering everything, the advantages attributed to analogies outweigh their disadvantages. They also expressed the need for further training on the effective use of analogies and limiting and mitigating their disadvantages. The concept of construction of analogies by the students themselves raised diverging points of view amongst teachers. They suggested that constructing analogies can present further advantages to the interpretation of analogies, alongside further challenges.

This study was carried out following the award of the Tertiary Education Scholarship (TES 2019 scheme), at the University of Malta to full fill the requirements needed for a Masters in Science Education.