

Challenges and Pedagogical Strategies in Teaching Chemical Bonding: Perspectives from Moroccan Educators

Authors : Sara atibi, Azzeddine Atibi, Salim Ahmed, Khadija El Kababi

Abstract : The concept of chemical bonding is fundamental in chemistry education, ubiquitous in school curricula, and essential to numerous topics in the field. Mastery of this concept enables students to predict and explain the physical and chemical properties of substances. However, chemical bonding is often regarded as one of the most complex concepts for secondary and higher education students to comprehend, due to the underlying complex theory and the use of abstract models. Teachers also encounter significant challenges in conveying this concept effectively. This study aims to identify the difficulties and alternative conceptions faced by Moroccan secondary school students in learning about chemical bonding, as well as the pedagogical strategies employed by teachers to overcome these obstacles. A survey was conducted involving 150 Moroccan secondary school physical science teachers, using a structured questionnaire comprising closed, open-ended, and multiple-choice questions. The results reveal frequent student misconceptions, such as the octet rule, molecular geometry, and molecular polarity. Contributing factors to these misconceptions include the abstract nature of the concepts, the use of models, and teachers' difficulties in explaining certain aspects of chemical bonding. The study proposes improvements for teaching chemical bonding, such as integrating information and communication technologies (ICT), diversifying pedagogical tools, and considering students' pre-existing conceptions. These recommendations aim to assist teachers, curriculum developers, and textbook authors in making chemistry more accessible and in addressing students' misconceptions.

Keywords : chemical bonding, alternative conceptions, chemistry education, pedagogical strategies

Conference Title : ICEPTS 2025 : International Conference on Educational Policies and Teaching Strategies

Conference Location : New York, United States

Conference Dates : June 03-04, 2025