

Pre-Service Teachers' Conceptual Representations of Heat and Temperature

Authors : Abdeljalil Métioui

Abstract : The purpose of this paper is to present the results of research on the conceptual representations of 128 Quebec (Canada) pre-service teachers enrolled in their third year of university in a program to train elementary teachers about heat and temperature. To identify their conceptual representations about heat and temperature, we constructed a multiple-choice questionnaire consisting of five questions. For each question, they had to explain their choice of an answer. At the methodological level, this step is essential to be able to identify the student conceptual representations. It should be noted that the selected questions were based: (1) on the works have done worldwide on primary and secondary students' misconceptions about heat and temperature; (2) on the notions prescribed in the curriculum related to the physical world and (3) on student's everyday contexts. As illustrations, the following are the erroneous conceptual representations identified in our analysis of the data collected: (1) The change of state of the matter does not require a constant temperature, (2) The temperature is a measure in degrees to indicate the level of heat of an object or person, (3) The mercury contained in a thermometer expands when it is heated so that the particles which constitute it expand and (4) The sensation of cold (or warm) is related to the difference in temperature. In conclusion, we will see that it is possible to develop situations of conflict, dealing specifically with the limits of the analogy between heat and temperature. These situations must consider the conceptual representations of the pre-service teachers, as well as the relevant scientific understanding of the concept of heat and temperature.

Keywords : conceptual representation, heat, temperature, pre-service teachers

Conference Title : ICPE 2019 : International Conference on Physics Education

Conference Location : Athens, Greece

Conference Dates : April 08-09, 2019