ABSTRACT

The current chemistry education solves problems related primarily to the setting of the curriculum contents, which would be professionally correct, appropriately extensive, and at the same time connected with current aspects of life in modern society, and to problems of teaching strategies that would stimulate the students into an interest in science and commitment to it. The main goal of this dissertation is to create an educational website with an interactive chemistry course for lower secondary schools (ISCED 2) and verify its effectiveness in school practice.

The first part of the dissertation describes methods of interactive chemistry teaching supporting the increase of the students’ cognitive activity and the effectiveness of the learning process using ICT. The second part characterizes the chemistry course thus created and lists various ways to apply interactive teaching in it. Our interactive course contains a total of 14 thematic units, each with 2–6 subthemes. All themes are processed with respect to the practical application of the subject matter using the listed interactive education methods.

This course was tested in 2018-2020 during chemistry lessons in Kazakhstan and Czech Republic, and the students’ opinions toward interactive teaching in this study were tested using a simple questionnaire survey.

The first verification educational materials of the interactive chemistry course was carried out from 11/2018 – 01/2019 in Kazakhstan. There was a total of 60 respondents (17 female adolescents and 43 male adolescents), which entailed a total of 58 hours of interactive teaching. The second verification educational materials of the interactive chemistry course was carried out from 12/2019 – 04/2020 in the Czech Republic. There was a total of 163 respondents (91 female adolescents and 72 male adolescents), which entailed a total of 18 hours of interactive teaching. The results showed that more than 60 % of the students enjoyed working in an interactive environment.