

## **ABSTRACT**

The aim of the dissertation is to compare the efficiency of inquiry-based teaching versus standard frontal teaching on the topic of the human excretory system at secondary school. In the theoretical part of the thesis a content analysis of pedagogical and psychological literature, focusing on the efficiency of education and inquiry-based teaching, was conducted. Furthermore current Czech curricular documents were analyzed, i.e. the Framework Education Programme for secondary schools and available biology textbooks for secondary schools. In the practical part, based on these analyses and the study of pedagogical and psychological literature, lesson plans for the frontal teaching and inquiry-based teaching were prepared, including a proposal for research activities for experimental education. To compare the efficiency of selected teaching methods, a research tool was created – a pre-test, a post-test 1, a post-test 2 and questionnaires for students and teachers. Students and teachers of seven grammar schools in Prague were involved in the didactic experiment. The aim of the questionnaire was to provide further data and describe in detail the statistical data collected from the testing of the students. The analysis of the questionnaire data revealed a large consensus between students and their teachers. In the pre-test there was little difference between the experimental group students' initial knowledge and the control group students' knowledge; in post-test 1 an improvement occurred in students of both groups, in post-test 2 a slight deterioration occurred in students of both groups. Whilst in the pre-test the difference between initial knowledge of students in the experimental group and students in the control group was not significant, in post-tests 1 and 2 a major difference between the groups manifested, in all cases in favour of the experimental group. The percentage success rate in individual test items of both post-tests suggests that the experimental group was more successful at solving the skills tasks aimed at testing higher cognitive levels. The success rate of students in both groups was almost the same in solving knowledge tasks which require mere recollection of a certain fact. The significance of the difference between POST1/2-PRE groups of students could be proved by a more complex regression model. This confirmed the contribution of inquiry-based teaching, especially in the area of developing cognitive skills. The detailed qualitative analysis of the didactic tests results revealed many shortcomings, which were most evident both in students' poor verbal skills and imprecise wording of their answers and also in the argumentation skills. Furthermore the dissertation studied the influence of possible covariates (final grade in biology, students'

sex, students' interest or disinterest in biology, school-leaving exam in biology, and the expected direction of further studies) on the students' performance in didactic tests.