[**Research Programme for Public Education Development of the Hungarian Academy of Sciences**](https://mta.hu/kozoktatas-fejlesztesi-kutatasi-program/research-programme-for-public-education-development-of-the-hungarian-academy-of-sciences-111934)

[**MTA-ELTE Research Group on Inquiry-Based Chemistry Education**](https://mta.hu/kozoktatas-fejlesztesi-kutatasi-program/scientific-foundations-of-education-research-program-of-the-hungarian-academy-of-sciences-111618)

**[Inquiry-Based Chemistry Education and Systems Thinking project](https://ttomc.elte.hu/publications/95)**

**GOALS AND EXPECTED RESULTS**

This longitudinal research project aims to improve experimental design skills and investigate the impact on these of the systematic application of a series of questions on the control of variables, the choice of materials and tools, and the sequence of experimental steps. 931 Grade 7 students from 25 Hungarian schools were involved in September 2021. Members of the research group and schools participating in the project can be downloaded from the [website of the research group](https://ttomc.elte.hu/publications/95). The students’ 4-year compulsory chemistry education is influenced by six student worksheets in each school year, provided by the research group. These also contain context-based and systems thinking tasks to maintain the students’ interest.

The impact of the intervention in terms of experimental design skills (EDS) and disciplinary content knowledge (DCK) is measured by structured tests in the beginning of the project (‘T0’) and in the end of each school year (‘T1’ – ‘T4’). Background data and answers to attitude questions are also collected. All data are statistically analysed by using the SPSS Statistics software (ANOVA and ANCOVA) to calculate Cohen’s *d* and *Partial Eta Squared* (PES) effect size values. The opinions of chemistry teachers who have piloted the worksheets and of pre-service teacher students who have been exposed to them in theory and practice are collected through questionnaires, the answers to which are analysed and summarised. The results are presented to interested colleagues at national and international conferences and in face-to-face and online workshops. Presentation slides from these are also available on the [website of the research group](https://ttomc.elte.hu/publications/95). The publication list can also be downloaded from there, which contains bibliographic data of publications in journals and edited volumes. Editable versions of the worksheets and tests can also be downloaded from the [website of the research group](https://ttomc.elte.hu/publications/95).

Photographs taken about the students doing the experiments are grouped according to the numbered student sheets and are available on the following website: [Természettudományos Oktatásmódszertani Centrum (elte.hu)](https://ttomc.elte.hu/galleries)