

STUDENTS IN THE CENTER OF CHEMISTRY CLASSES: INQUIRY-BASED LEARNING

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STEM subjects, particularly Chemistry, are less popular among secondary school students. This issue is not unique to Hungary; it also exists in other countries [1, 3]. Student-centered strategies incorporated into classroom instruction can be a possible solution for this problem. Our main area of interest was the prevalence of inquiry-based learning (IBL), which has the potential to improve other important skills in addition to attitudes [4].

The questionnaire survey we conducted in the summer of 2023 involved 124 teacher trainees studying at the University of Debrecen. The data show how frequently teachers applied student-active teaching methods in Chemistry classes around 2020, as well as how these methods affected learners' attitudes toward Chemistry. It is quite informative to ask teacher trainees because this way we not only gain information about the past, but also have some conjectures about the future, as people tend to teach in the same way that they were taught [2].

As for the pilot questionnaire, it was compiled from previously tested questions (for instance, from the relevant questionnaire of the PRIMAS project), as well as from questions developed by us on aspects that have received limited attention so far. Our subscales include attitudes toward Chemistry (4-point Likert scales and semantic differential scales), experiments and other methods used in classes (4-point frequency scales), and the appearance and likeability of the constructivist approach of IBL in lessons (4-point frequency scales and 4-point Likert scales). Furthermore, the respondents were asked to rank the characteristics of an ideal Chemistry class in order of importance. We used SPSS 28 to analyze our data.

The results demonstrate that some of the components of IBL —such as open-ended questions— were present in classrooms even though the strategy itself was not used at the time. We identified a positive correlation between learners' attitudes and the appearance of particular methods including student-run experiments ($r=0.289$) and real-life examples ($r=0.378$). Another significant finding is that students prefer diverse lessons which correlates with the facilitator role of the teacher ($r=0.43$).

Despite the potential benefits of IBL, however, it is critical to apply student-centered strategies consistently since they have some less desirable aspects as well. In order to determine which factors are most common and how they either improve or worsen learners' attitudes toward chemistry, we are asking current secondary school students about the same factors in a follow-up study.

References

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