IBL in Chemistry Education – Lessons Learned

Students' attitudes toward school subjects are influenced not only by the content of the curriculum but also by how the material is delivered - making the teaching strategy employed by the educator critical. In our research, we analyze the potential benefits and drawbacks of the inquiry-based learning (IBL) strategy in the context of chemistry education.

Data were collected from N=273 pre-service teachers. Our online questionnaire focused primarily on the structure of high school chemistry lessons, with particular attention to whether elements of IBL were present. Additionally, respondents' attitudes toward chemistry as a subject were surveyed, as well as their vision of an ideal chemistry lesson.

To analyse the factors influencing subject attitudes, we conducted multiple regression analysis using the SPSS statistical program. Our findings indicate that the teacher's role as a facilitator (B=0.273, p<0.001), incorporating problem-solving tasks related to everyday life (B=0.260, p=0.007), and emphasizing the societal relevance of chemistry (B=0.205, p<0.001) significantly contributed to fostering more positive student attitudes. Conversely, neither the frequency of experiments nor the use of (closely IBL-related) open-ended questions showed a significant effect in this regard.

A key takeaway is that during the implementation of inquiry-based learning, special attention must be paid to gradually involving students and providing appropriate levels of teacher support. If students are instantly placed at the center of the learning process and they are given excessive responsibility, the newly introduced strategy may even yield negative effects.

Our results highlight that IBL, as an innovative approach in chemistry education, can effectively support students' sustained interest in the subject provided that its implementation is gradual and consistent. The theoretical value of our research lies in its contribution to uncovering the applicability of IBL, while on a practical level, we provide insights for teachers to successfully integrate the strategy into their practice.

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