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Annotation

STEM (Science, Technology, Engineering, and Mathematics) education faces similar issues worldwide. For instance, Chemistry is commonly taught in a way that content-orientedness and factual knowledge are dominant, whereas other skills are neglected. Students develop negative attitudes toward Chemistry, and the number of people pursuing a career path in this field is declining (Malmos & Chrappán, 2016; Reid & Ali, 2020). However, several attempts have been made to find a solution for this phenomenon, and our research focuses on one of these. Implementing student-centered strategies can have a positive impact on attitudes while enhancing other valuable skills as well (Reid & Ali, 2020). On this premise, we conduct research on student-centered strategies in Chemistry education: we are currently working on the theoretical frameworks for our research, and subsequently, we will collect empirical data by surveying students, student teachers, and teachers about their perceptions of inquiry-based learning. In my presentation, I am aiming to present conceptual information about IBL, its effects, and possible techniques.

Inquiry-based learning (IBL) is one of the student-centered strategies. The 85 papers we have read (while adhering to the PRISMA Statement standards) suggest that it is challenging to precisely define what IBL is. Even though many teachers are familiar with the term, they are unsure how it works in practice or how to begin using it (Yager & Akcay, 2010). IBL can be viewed as an umbrella term including, for instance, discovery learning, problem-based learning (PBL), project-based learning (PjBL), and further similar methods (Prince & Felder 2006; Kirschner et al. 2006; Nagy, Lászlóné 2010).

It has its roots in constructivist approaches, and the strategy places the students at the center of the learning process. They are given more freedom and responsibility, while the teacher takes on the role of a facilitator. There are puzzling questions and instructive situations present when using this strategy, which students can solve through inquiry and scientific thinking. Furthermore, the application-led exercises and teaching methods are also consistent with IBL. In fact, the sole use of traditional lecturing is most likely the only strategy that is incompatible with inquiry-guided learning, according to Lee (2004). Depending on the type of inquiry-based learning (confirmation, structured, guided, or open-ended inquiry approach), teachers can assist their students to different extents.

We attempted to discover both the origins of IBL and its modern meaning. Since our study is primarily concerned with Hungarian education, we placed a strong emphasis on dealing with Hungarian studies that are relevant to the topic. The most recent empirical research from 2022 is directly related to our own research. This study, which was conducted in the Southern Great Plains region, concluded that although the teachers in the examined institutions value constructivist approaches, there is still room for improvement in terms of their practical implementation (Bánfi & Korom, 2022). Our hypotheses also point in this direction, and our goal is to investigate how frequently IBL appears in Hungarian classrooms and whether there is a correlation between its application and student attitudes toward Chemistry. Our review provides a sound foundation for the empirical phase of our research, as well as methodological descriptions and connections that can be directly applied in public education.

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