“Shining lighthouse in the sea of calculus, geometry, and theoretical mechanics”: The seminar introducing pre-service teachers to their future profession

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Abstract. The *Physics Teaching Seminar* introduced in the second year of undergraduate studies, serves as an important component in preparing pre-service physics teachers for their future profession. It provides students with early insights into the diverse aspects of teaching, engaging them in discussions on various facets of the „teaching craft”. We build the seminar upon both our and students’ experience, aiming for future teachers to think about their profession independently and critically. The aim of the poster presentation is to acquaint interested parties with the course design, its strengths, and potential risks.

Introduction

Research has shown that pre-service teacher education is widely regarded as a key factor in ensuring the quality of education, as it aims to shape future teachers and give them the tools and skills they need to meet the challenges of their future careers [1, 2]. Novice physics teachers identify several of their practical challenges in transitioning from pre-service to further education. It is mainly about *Teaching approaches; Preparation and planning; Assessment; Interaction with their colleagues; Student motivation* etc. [3]. We try to prepare students to solve similar situations in the seminar described in this article.

The preparation of future physics teachers is demanding at our faculty. Throughout the three years of bachelor’s studies, students predominantly delve into courses centred around pure physics or mathematics, covering topics such as Mechanics, Electricity and Magnetism, Optics, Calculus, Algebra etc. Although some of these courses include excellently designed strategies on how the subject matter could be didactically transformed for secondary school, the main emphasis remains on the physics or mathematical content; the possibility of discussing pedagogical strategies is marginal. It’s not until the sixth semester that students meet pedagogical practice, where they observe and conduct their own teaching sessions within schools.

However, our experience shows that the early inclusion of a teaching-focused subject holds high motivational value and represents a refreshing departure for students from the subject-specific (mathematics or physics) coursework they’re accustomed to. Hence, we introduce the *Physics Teaching Seminar* as early as the second year of study. This seminar serves to get students thinking more about their role as future educators. The aim of our contribution is to present the seminar’s design and describe its pivotal components.

Goals and syllabus

As previously mentioned, the primary objective of the seminar is to provide pre-service teachers with an early introduction to the issues related to teaching itself. While students have traditionally approached questions concerning schools and education from the viewpoint of pupils or students, the seminar offers them their first glimpse into the perspective of a teacher. We do not delve into theoretical psychological, pedagogical, or didactic theories; instead, we draw from our experience in teaching at primary and secondary levels.

With a weekly workload of 2 hours, the seminar targets undergraduate students in their second year of study. In the winter semester, it’s a mandatory component of the curriculum,

while in the summer semester, it becomes an elective. However, most students participate in both semesters. While going through the syllabus, we discuss topics such as:

- awareness of one's own idea of a good teacher,
- the role (both formal and informal) of a teacher within school settings,
- documents and regulations that teachers are required to follow (from Czech laws to school principal directives),
- the work of a class teacher,
- summative and formative assessment,
- establishing communication and collaboration with parents,
- criteria for selecting appropriate textbooks and educational materials,
- the issue of homework assignments, etc.

In addition to addressing general issues on "teaching craft", we also concentrate on specifics of physics teaching. Students create their first lesson plans and perform an excerpt from the lesson to their peers. An intriguing and enlightening activity involves correcting authentic written exams of real lower-secondary pupils (around 12–13 years old), which each student evaluates and grades; subsequently, students compare how different their requirements, comments, and resulting grades can be.

Feedback

Each semester, the faculty conducts a survey wherein students assess courses and seminars using a numerical scale or brief comments. While this survey consistently yields positive feedback regarding our subject, we have found it insufficient for gaining a detailed understanding of what students truly glean from the seminar. Therefore, during the final seminar of the semester, students are allotted 20–30 minutes to provide us with an unstructured written reflection. In this reflection, they are encouraged to describe what thoughts come to their minds in connection with the seminar.

Quoting from the feedback of one student from January 2024: *"Our field of study is tough. This seminar for me was like a brightly shining lighthouse in the dark sea of calculus, geometry, and theoretical mechanics. It was a reminder for me of why I want to do what I do... In this seminar, more than in any other subject so far, I realized that I will truly teach and become a teacher."* From this and similar reflections from students, we gather information that the seminar's objectives have been achieved.

Conclusion

We believe that our experience with this seminar for pre-service teachers can serve as inspiration for other teacher trainers. If anyone is interested in learning more about the seminar or sharing their experiences, we would be happy to meet and discuss with them.

References

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