

The role of experimental activities according to preservice Physics teachers during a Supervised Internship

Monday, 13 December 2021 17:00 (20 minutes)

Abstract. This research sought to investigate, using Pecheutian's Discourse Analysis, which representations are attributed by future Physics teachers to the role of experimental activities developed during the activities of a Supervised Internship. The results show that, in their teaching practice, preservice teachers reproduce the practice of their professors. Furthermore, during the planning of their classes, academic productions in the area of education hardly are considered.

1 Introduction

The gap between theory and practice, and also between university and schools of basic education, is already discussed by several researchers in the field of Science Education, among them, Pimenta and Lima [1], stating that this situation happens soon in initial teacher training.

According to the aforementioned authors, the Supervised Internships developed in undergraduate programs (called "licensure" in Brazil) can be considered as a privileged moment of teaching training. It allows to cross all the subjects present in the curricular structure, in addition to constituting a space for synthesis at the end of the degree. It is also responsible for bringing the future teacher closer to the professional reality, characterizing itself as an important moment of teacher education, which provides opportunities for critical reflection in the social practice of educating [1].

Pimenta [2] also criticizes the fragmentation of teaching knowledge, arguing that they are worked separately and in a disjointed way. In this sense, as a way to overcome this problem, this research aims to investigate how preservice physics teachers interact with academic production, related to experimental activities in physics teaching, and also how they benefit from it for the planning and development of practical classes. For this purpose, we sought answer to the following question: What representations are attributed by preservice physics teachers to the role of experimental activities?

2 Experimentation in Science Teaching

Experimental activities are identified, both by teachers and students, as an important didactic resource to be used in the classroom, with the aim of reducing the difficulties of teaching and learning science [3].

Hodson [4] and Wesendonk [5] associate in three dimensions the characteristics of scientific knowledge, the aspects that experimental activities have in relation to the objectives and approaches that are intended to be achieved with the teaching activity: a) Conceptual Dimension: which seeks to help students to learn (elements of) science (specific scientific area); b) Epistemological Dimension: which seeks to help students learn (elements) about how science (specific scientific area) is constructed and developed; c) Methodological Dimension: which seeks to help students learn (elements) about how to do science (specific scientific area) [5].

Wesendonk [5] also considers experimentation in three modalities to be developed by teachers in science education: experiments with physical apparatus, thought experiments and computer simulation. For experiments with physical apparatus, the author characterizes four types of experimental activities: a) experimental demonstrations; b) predict-accomplish-explain; c) experimental verification; d) experimental resolution of a student's reality problem.

3 Theoretical and methodological referential

The theoretical and methodological framework adopted in this research is the Pecheutian Discourse Analysis (DA). According to Orlandi [6], discourse is given as a way of materializing the manifestations, both of the relations of forces and of meanings, which reflect conflicts of an ideological nature. In this sense, there is no discourse without a subject, nor a subject without ideology. The subject is descentered and positions himself within ideological formations, does not produce his own meanings and has no control over what he says or thinks [6].

Seeking to understand the effects of the meanings produced, it is important for DA to know and consider the

context and conditions of production of speeches. In this sense, this study is organized during the activities of the Supervised Internship, in which future teachers planned and taught a short course. The corpus of the research was constituted from the speeches produced by the undergraduates in three moments of the Supervised Internship: before, right after the regency and at the end of the Internship.

4 Conclusion

The results show that, when planning the practical activities of the Internship, future teachers have the proposal to carry out experimental activities under an investigative perspective. However, in their teaching practice, they end up reproducing the practice of their professors. In addition, even with their speeches indicating criticism of the traditional teaching model, when preparing their classes, academic productions in the area of education hardly are considered.

Acknowledgements

The authors thank the National Council for Scientific and Technological Development (CNPq - Brazil) and the Coordination for the Improvement of Higher Education Personnel (CAPES - Brazil) for funding this research.

References

- [1] S. G. Pimenta and M. S. L. Lima. *Estágio e docência*. 5th ed. Cortez, São Paulo, 2010.
- [2] S. G. Pimenta. *Saberes Pedagógicos e Atividade Docente*. 3rd ed. Cortez, São Paulo, 2002.
- [3] L. S. Campos, M. S. T. Araújo and L. H. Amaral. Levantamento de dissertações e teses envolvendo a Experimentação em Ensino de Física e o Laboratório didático de Física entre 2002 e 2011. *Revista de Produção Discente em Educação Matemática*. **3(1)** (2014) 50-65.
- [4] Hodson, D. Hacia un enfoque más crítico del trabajo de laboratorio. *Enseñanza de las Ciencias: Revista de investigación y experiencias didácticas*, **12(3)** (1994) 299-313.
- [5] F. S. Wesendonk. *O uso da experimentação como recurso didático no desenvolvimento do trabalho de professores de Física do Ensino Médio*. Dissertation (Masters in Science Education). Bauru, São Paulo State University (Unesp), School of Sciences, 2015.
- [6] E. P. Orlandi. *Análise de Discurso: princípios e procedimentos*. 12th ed. Pontes Editores, Campinas, 2015.

Primary authors: PARMA, Fabiano Willian (São Paulo State University (Unesp)); NARDI, Roberto (IUPAP)

Presenters: PARMA, Fabiano Willian (São Paulo State University (Unesp)); NARDI, Roberto (IUPAP)

Session Classification: Parallel 2 - Wroclaw/Guayaquil

Track Classification: 9. Initial teacher education, teacher professional development and Technological Pedagogical Content Knowledge