



Education for Sciences in the Pre-School: Contributions from a Training Programme

Maria José Afonso Magalhães Rodrigues, Rui Marques Vieira (Supervisor)
CIDTFF - Research Centre for Didactics and Technology in Teacher Education

Abstract

This research was developed according to the various phases schematically presented in Figure 1.

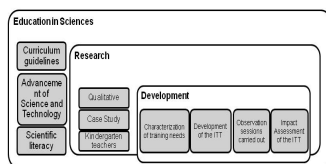


Fig.1 - Global Scheme of the research

We concluded that the ITT had a very positive impact because it allowed teachers to understand the importance of approaching sciences in pre-school and raise their interest to didactic and pedagogical practices with innovative STS orientation, favoring a strategy to achieve practical and experimental work.

Introduction

It is consensual nowadays that it is urgent to train people with a high level of scientific literacy. Therefore, and according to our personal and professional interests, we developed this research in accordance to the issues outlined in Figure 2.

Research issues

- Which kind of training in experimental science was offered in the initial and in-service training courses to kindergarten teachers in the district of Bragança?
- Is experimental work in sciences often contemplated in in-service training to kindergarten teachers in the district of Bragança? If so, how?
- What do kindergarten teachers in the district of Bragança say about their working practice in the field of World knowledge?
- What type of experimental activities and how often do educators use them with children in their didactic-pedagogical practice?
- What is the impact of a in-service education program implementation for education in sciences in pre-school on the level of the didactic and pedagogical practices of teachers?

Fig.2 – Research questions

Theoretical Framework

The theoretical framework is organized in three sections represented in Figure 3 and backed up by some prominent authors who address these themes.

Development of ITT

The main purpose of ITT is to contribute to the deepening of various scientific and methodological issues in the field of science and its teaching and promote awareness in educators for the taste for education in sciences. This allows the implementation of practical activities and experiments in a systematic and continuous way in its didactic and pedagogical practices.

The development of ITT has gone through several phases as shown in figure 4.



Fig.4 – Training Program Development

Methodology

This study is qualitative in nature, fits into the category of a case study, and the epistemological point of view is interpretive. Initially, we worked with all kindergarten teachers in the district of Bragança. This universe was later reduced to six teachers who volunteered to collaborate in the research.

To collect the information we used several techniques and tools, as evidenced in Table 1, shown below:

R.Q.	Technique (s)	Instrument (s)
1, 2 and 3	Survey	Questionnaire for the professional characterization of kindergarten teachers.
4	Survey Observation	Questionnaire VOSTS Interview Researcher's Diary
5	Survey Observation	ITT Assessment questionnaire Portfolio Researcher's Diary

Tabela 1 - Techniques and tools used for data collection

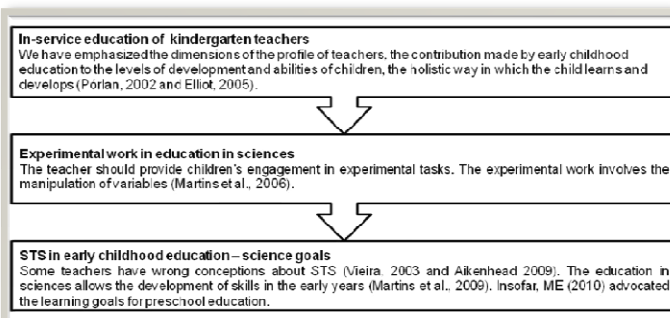


Fig.3 - Theoretical research

According to the techniques and tools used to collect the information we have chosen to analyze the data according to the diagram in Figure 5.



Fig.5 – Data analysis

Results

With regard to initial and in-service education in sciences educators mentioned the need for more training.

For the STS designs, results were obtained in two moments of the VOSTS questionnaire: at the beginning and at the end of the ITT. See Tables 1 and 2.

Kindergarten teacher	Answer categorization		
	Realistic	Acceptable	Naive
A	8	10	1
B	6	10	3
C	5	12	2
D	7	11	1
E	7	7	5
F	5	12	2

Tabela 2 - Categorization of responses given by kindergarten teachers to the VOSTS survey at the beginning of the ITT

Kindergarten teacher	Answer categorization		
	Realistic	Acceptable	Naive
A	13	5	1
B	3	11	5
C	7	8	4
D	11	8	9
E	7	9	3
F	9	9	1

Tabela 3 - Categorization of responses given by kindergarten teachers to the VOSTS survey at the end of the ITT

We found that three teachers reduced the number of naive responses, one maintained them and two increased them.

Regarding the characterization of didactic and pedagogical practices the educators:

- ✓ used practical work more frequently;
- ✓ made reference to the nature of scientific knowledge;
- ✓ promoted oral questioning and favored group work as a strategy;
- ✓ showed a growing concern regarding orientation;

- ✓ Provided an environment of empathy;
 - ✓ encouraged children to express themselves freely.
- This is evidenced in the pictures shown below.

Conclusion

The main conclusions of the study are presented in the diagram of figure 6



Fig.6 – Representation of the main conclusions

Referências

- Aikenhead, G. S. (2009). *Educação Científica para todos*. Mangualde: Edições Pedagogo.
- Elliott, A. (2006). *Early childhood education: Pathways to quality and equity for all children*. Australian Education Review. Austrália: Australian Council for Educational Research.
- Martins, I., Veiga, M. L., Teixeira, F., Tenreiro-Vieira, C., Vieira, R. M., Rodrigues, A. V. & Couceiro, F. (2006). *Educação em Ciências e Ensino Experimental - Formação de Professores*. Lisboa: Ministério da Educação, DGIDC.
- Martins, I., Veiga, M. L., Teixeira, F., Tenreiro-Vieira, C., Vieira, R. M., Rodrigues, A. V., Couceiro, F. & Pereira S. (2009). *Despertar para a ciência - actividades dos 3 aos 6*. Lisboa: Ministério da Educação, DGIDC.
- Ministério da Educação (2010). *Metas de aprendizagem para a Educação Pré-Escolar e para o Ensino Básico*. Acedido em <http://www.metasdeaprendizagem.min-edu.pt/educacao-pre-escolar/apresentacao/>
- Pórtan, R. (2002). *La formación del profesorado en un contexto constructivista. Investigaciones em Ensino de Ciências*, 7(3), 271-281. Acedido em http://www.if.ufrgs.br/ienici/artigos/Artigo_ID93/v7n3a2002.pdf
- Vieira, R. M. (2003). *Formação Continuada de Professores do 1º e 2º Ciclos do Ensino Básico para uma Educação em Ciências com Orientação CTS/PC*. Tese de Doutoramento não publicada. Aveiro: Universidade de Aveiro, DDTE.

